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Business Staff on Page 4

XT WEEK ...

Machine Tool Show Preview & Guide
Economic Significance of the Show
What Users Expect from New
Models
Getting the Most from the Show
Brittle Lacquer Technique
Inert Gas-Shielded Arc Welding Jobs

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 8

AUGUST 25, 1947

NEWS

★ As the Editor Views the News	45
Adequate Winter Coal Stocks Expected	49
★ Present, Past and Pending	51
Basing Point Battle Lines Forming	52
Adequacy of Steel Capacity To Support Full Employment Questioned	53
Car Builders Say Need Is for Balance in Materials Supply	54
Withdrawal of Standby Tools Eases WAA's Job	56
WAA Officials, Dealers Discuss Tool Sales Plan	57
Blumer Leaves U. S. Steel Board of Arbitration	57
★ Windows of Washington	58
Ground Broken for Atomic Pile at Brookhaven	61
Western Metal-Using Industries Still Expanding	62
French Favor Meeting Europe's Steel Needs from Local Mills	63
★ Mirrors of Motordom	65
Barium Planning Expansions and Improvements	68
★ Briefs	69
★ The Business Trend	70
★ Men of Industry	72
★ Obituaries	77
★ Construction and Enterprise	158

TECHNICAL

Visual Scheduling System Steps Up Shipment of Steel Orders	78
Automatic Electroplating Line Handles 11,000 Parts in 16 Hours	80
★ Seen and Heard in the Machinery Field	82
Tools Revolve About Work in Turning Large Crankshafts	84
Effect of Stabilizing and Stress Relief Heat Treatment of 18-8	86
★ Engineering News at a Glance	90
Silver Plating Facilitates Bonding Glass to Steel	92
★ New Literature	94
Specification Changes in Fire Fighting Equipment Met by Arc Welding	96
Combined Stamping Operation Increases Output at Same Rate of Effort	102
★ Progress in Steelmaking—Single Slag Basic Electric Heats	104
Article Prize Contest	107
Production Control in Direct-Current Arc Welding	108
Unconventional Resistance Welding Reduces Production Time and Costs	119
★ New Products and Equipment	131
★ Helpful Literature	135

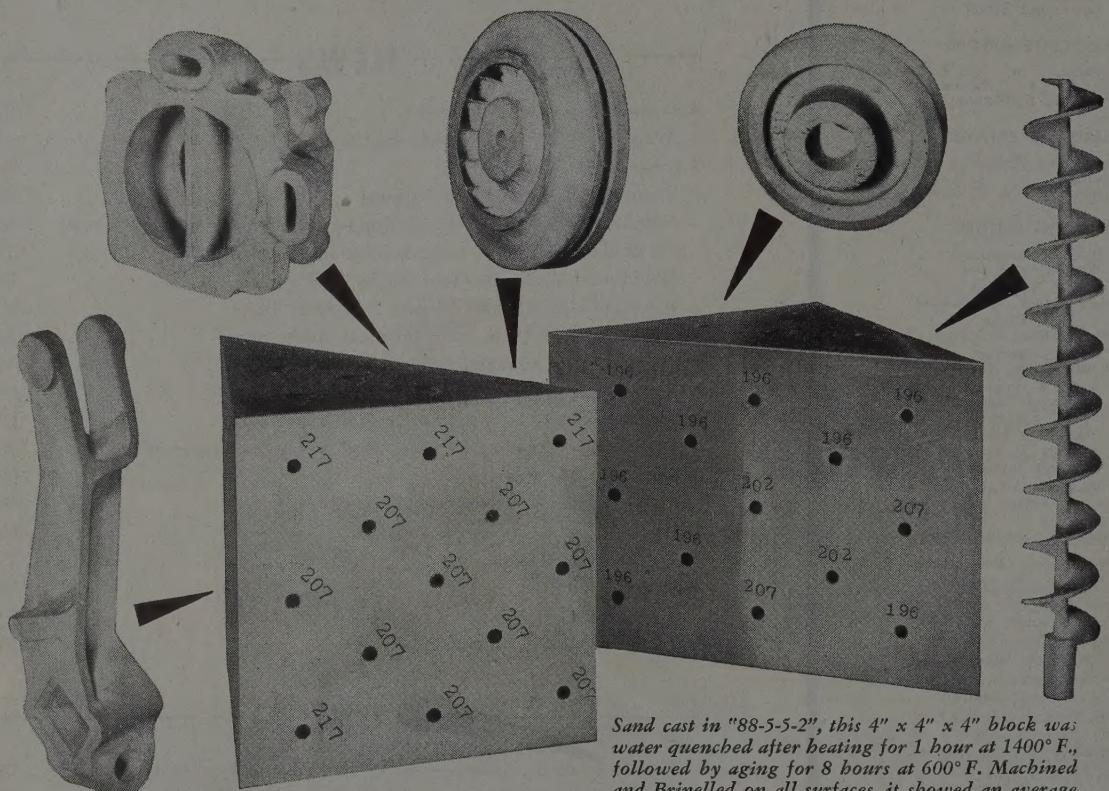
MARKETS

Metalworking Operations Curbed by Steel Shortage	137
★ Market Prices and Composites	138
Government Plans Heavier Purchases of Metals	142
★ Index to Advertisers	168
★—Denotes regular features.	

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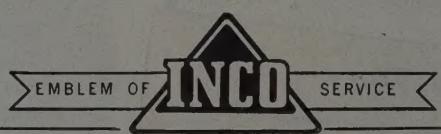
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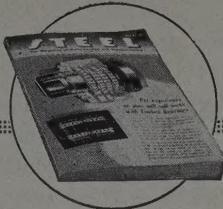
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AS THE EDITOR VIEWS THE NEWS

August 25, 1947

Tempest in Teapot

Competition has been an important ingredient in the recipe for the successful American economic system. England, France, Germany, Japan—in fact, almost every industrial nation except the United States—has paid dearly for the experience of substituting cartels, monopolies and other devices for the natural and self-correcting institution of reasonably free competition.

With this historical record in mind, most American industrialists know—whether or not they will avow it openly—that competition is a great American asset. Therefore, if there were a situation wherein an industry were clearly guilty of restraining competition or of promoting monopolies, they would strongly favor corrective measures. In short, if the government came to bat with a clearcut case of restraint of trade or monopoly, public sentiment—including that of enlightened industrialists—would be in the government's corner.

In view of this background, why is it that the government has been so unsuccessful in its anti-monopoly suits? The answer is that the government too often has been influenced by political instead of by economic motives.

Our government initiated NRA and encouraged industrial corporations to cooperate with it. The Supreme Court outlawed NRA. Government officials urged some industries to continue NRA practices. Some did and as a result a few—notably the oil companies—were fined for their obedience.

Later, the government instituted a racketeering device whereby a company, charged by the government with infraction of an anti-trust law, could escape the cost of a long-drawn-out legal contest by pleading guilty. The consent decree was an abominable practice.

Now the Federal Trade Commission charges steel producers with having conspired to increase steel prices. The timing and circumstances suggest two motives. One, the government takes this means to bolster its argument for lower prices and to divert attention from the government's responsibility for higher prices. Secondly, the government takes this action as a sop to the unions, some of whose leaders are demanding that the government do something about prices.

In the case of steel, the charges are largely a rehash of those against Pittsburgh Plus, doctored to fit the present multiple basing point system—which, after all, is industry's best compromise in the face of previous government suits. Would any price system be immune from government criticism under present circumstances?

The government actions will prove futile if, as seems likely, they are initiated more to support an economic fallacy and to pander to a questionable political alliance than to correct suspected abuses.

• • •

IMPORTANT TEST CASE: At the time the coal miners went back to work under their new contracts, it was generally agreed that because of incentives of higher wages and other more favorable working conditions, output of coal would not suffer in spite of the fewer number of hours worked per week.

Thus far this has not been the case. During the first six weeks after the miners resumed work, out-

put was 55,375,000 tons, compared with 69,353,000 tons in the comparable weeks of 1946. This is a loss of 13,978,000 tons, or about 20 per cent. If this ratio were to continue, there would be plenty of coal trouble next winter.

It is too early to know whether this deficiency in coal output is due to the new contract or to temporary conditions. Some authorities claim that absenteeism among coal miners has been abnormally

(OVER)

AS THE EDITOR VIEWS THE NEWS

high since the new contract went into effect. This could be due to the excessive heat, which would be a fairly plausible excuse for a miner to be "unable or unwilling" to work. On the other hand, it could be due to an inclination on the part of some miners to feel that with the higher unit wage rates they can afford to miss a day or two of work more frequently than heretofore.

This is an important test case that will bear close watching.

—pp. 49, 70

* * *

SOME STEEL STYMIED: Senator Reed of Kansas presents figures on steel shipped to car builders and railroads and charges that freight car builders are not producing cars in the volume which steel supply will permit.

In reply, S. M. Felton, president, American Railway Car Institute, points out that overall tonnage of steel is only one consideration and that balanced supply of sheets, shapes, pipe and other rolled steel products, together with the proper complement of parts, is equally important. Also, all steel shipped to a carshop does not necessarily go into new cars. Sometimes it can ease the car shortage more effectively if it is diverted to repair cars.

This point that mere tonnage of steel, regardless of form or size does not relieve shortages is an important factor in the alleged mystery of "where is all the steel going?" Lots of the steel being shipped can't be used immediately or for the purpose intended because of unbalanced inventories. —p. 54

* * *

HEADING OFF TROUBLE: When one thinks over the history of industry-labor relations during the past few years he is apt to conclude that it is a record of misunderstandings and strife.

Dr. Herbert Blumer, chairman of the arbitration board created by the 1945 wage and hour contract between United States Steel Corp. and United Steelworkers of America-CIO, has resigned to resume his professorship at University of Chicago. Ralph T. Seward, permanent umpire under an agreement between General Motors Corp. and United Automobile Workers-CIO, will succeed him.

This first personnel change in the steel arbitration board brings to light the fact that the three-man board since its inception has handled 501 contract grievances from employees.

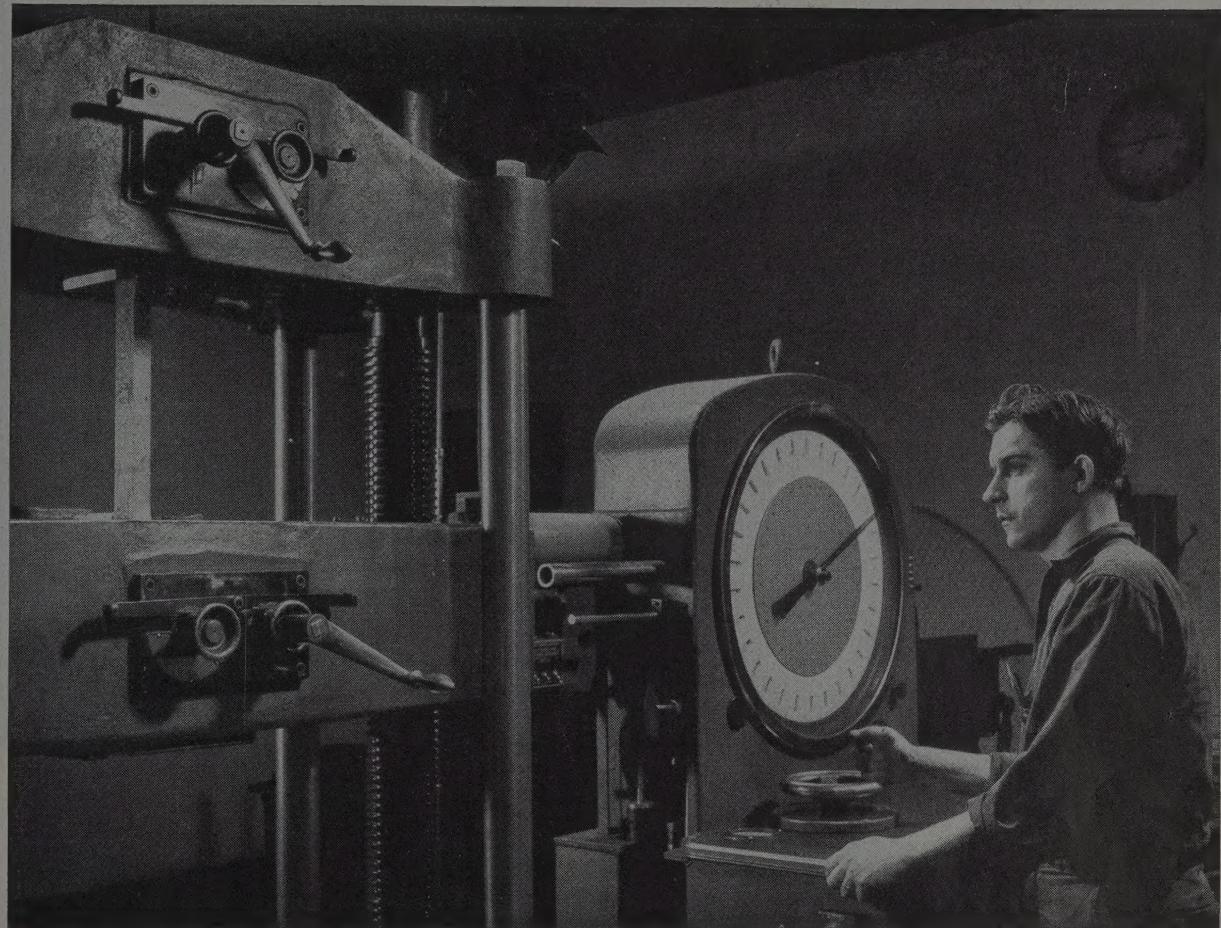
Perhaps it is too early to judge results, but it is possible that the arbitration boards, umpires and others who are trying to resolve differences before they lead to serious trouble are accumulating experience and prestige that will work effectively for industrial peace in the future.

—p. 57

SIGNS OF THE TIMES: One of our editors, while visiting a Wisconsin machine tool builder's plant, was told that a certain machine would turn out so many automobile parts in a 48-minute hour. "What," asked the editor, (p. 83), "is a 48-minute hour?" Replied the tool builder: "One of the facts of life which we face today is that the average production operator actually works only 48 minutes out of every hour. We rate our machines on the 'human hour' instead of the 'clock hour.' . . . Work has begun at Brookhaven, Long Island, N. Y., on the first atomic energy pile to be built in peacetime. It will cost \$10 million (p. 61) and will be operated by Associated Universities, Inc., an organization formed by nine eastern schools. . . . Frenchmen are arguing strongly that France and not Germany should be western Europe's main source of steel. They say that if France can be supplied with coke from the Ruhr, French steel output can be raised from 6 million to 10 million tons annually immediately. One ton of coke shipped from Germany to Lorraine, they contend (p. 63), will have the same overall effect on Europe's steel production as the shipment of three tons of iron ore from France to Germany. . . . Electric power output is at a seasonal high point. Output of 4,923 million kilowatt-hours in the week ended Aug. 16 (p. 70), has been exceeded only by the all-time record of 4,940 million in the week ended last Dec. 21. . . . When occasionally railroads lose boxcars or steel mills lose tons of steel, it is because of defects in paper work and control. A visual scheduling system developed by a producer of special steels (p. 78), has reduced errors and losses appreciably and has greatly increased the percentage of orders shipped complete and on time. . . . Perennial debate as to whether we should conserve certain mineral resources by importing our needs from abroad or should encourage development and use of domestic ores (p. 58), has been aroused anew by President Truman's veto of H.R. 1602. . . . Visitors in automobile industry plants get the impression that nearly every master mechanic and members of his staff, as well as numerous executives in other departments (p. 65), will spend several days at the National Machine Tool Show, Chicago, Sept. 17-26. This parallels reports from many other industries, indicating that attendance at this unusual event may exceed all expectations.

E. L. Shiner

EDITOR-IN-CHIEF



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Continuity in the flow of coal from the mines is being counted on by industry to keep its wheels turning so the currently high rate of industrial production can be maintained. Leaving a preparation plant at Lochgely, W. Va., this coal is ready to move to consumers

Adequate Winter Coal Stocks Expected

Steel and metalworking industries displaying only mild concern about supplies over coming months despite lag in coal output since new mine wage pact, cutting work-week to five days, was effected. Serious shortages of gas and oil for industrial use threaten

POSSIBLY the current heat wave over a large part of the nation has something to do with it—temperatures in the nineties not being conducive to much heavy thinking about coal—but the fact remains industrial coal consumers for the first time in several years do not appear especially concerned about next winter's coal supply.

Survey of important manufacturing centers by STEEL has developed the fact that only here and there is any apprehension over coal stocks apparent in the steel and metalworking industries. However, the same cannot be said with respect to gas and oil, severe shortages of which are threatened, and against which industry is installing standby storage equipment on a substantial scale.

To some extent the lack of concern about coal is surprising in view of manufacturing industry's serious supply difficulties in recent years, and especially considering the fact production of coal since the first of July this year, when the miners went on a 5-day week under the

terms of their new wage agreement, has been running behind output in the like period of last year.

Actually, production of coal in the first six weeks after the new coal wage pact went into effect fell about 20 per cent under output in the corresponding weeks of 1946, the total in the 1947 period being 55,375,000 tons against 69,353,000 tons in the like weeks of 1946. The weekly record of production in net tons compared with a year ago as reported by the National Coal Association is as follows:

Week ended	1947	1946
July 5	1,940,000	6,667,000
July 12	6,235,000	12,865,000
July 19	12,100,000	12,596,000
July 26	11,800,000	12,603,000
Aug. 2	11,550,000	12,310,000
Aug. 9	11,750,000	12,312,000
Total 6 weeks	55,375,000	69,353,000

The figures show the miners have produced 13,978,000 tons less coal under

the 5-day week schedule, a drop of approximately 20 per cent from a year ago, which rate of loss, if continued, would cut production in the 12 months, July 1, 1947, to June 30, 1948, some 120 million tons under total output of 600,164,000 tons in the like months, July 1, 1946, to June 30, 1947. Such a drop would be calamitous in event manufacturing operations are maintained at the high rate of the past year. Actually, however, even the most pessimistic do not expect such a sharp decline, the view being expressed that weekly output will be stepped up over coming months through increased efficiency and productive effort on the part of the miners.

As a matter of fact, coal producers think productive efficiency of the miners will increase to the point where whatever loss has been occasioned by the shorter work-week to date will be more than made up. They feel too little time has elapsed to permit of a real demonstration of what the miners can, and will, do. At the same time they point out that accumulative production this year to date is up about 20 per cent over that in the like period of 1946, thus assuring industry sufficient supplies over the winter and spring months despite the apparent lag in output since the new coal wage agreement became effective.

Despite this assurance from the coal

producers, however, some authorities are inclined to be skeptical of the outlook, holding that increased miner productivity will not be enough to provide all the tonnage needed. In fact, some of these observers maintain that unless the miners go to a 6-day work-week, output necessary to care for domestic and export needs will fall short by from 25 million to 40 million tons in the period July 1, 1947, to June 30, 1948.

Industrial users of coal, including steel producers, metalworking plants and public utilities, of course, are not neglecting stockpiling. In the main, however, with the possible exception of utilities, stockpiling activity is not being pressed to an unusual degree, though indications are inventories will be greater this winter than a year ago. Since early in World War II, coal inventories have been considerably below levels carried in prewar days, and as a result, operations have been curtailed from time to time when the miners chose to lay down their tools. Consequently, it is only to be expected that stocks will be replenished to the point made possible by available storage and handling facilities so long as coal moves from the mines in steady volume.

The matter of building coal inventories to safer and more comfortable levels is not one of mere decision, however. The rapidity with which stocks can be accumulated is dependent upon

factors over which the consumer has little or no control. In the first place, the rate at which coal is being mined currently and the tremendous overall demand limit the amount which can be laid up. While most steelmakers own their own mines, they also purchase large tonnages from outside producers; in the second place, lack of railroad coal cars puts a limit on shipment of coal from mines.

Some additional coal storage and handling facilities are being installed in the steel and metalworking industries. In the main, however, since existing facilities have not been taxed in recent years, largely due to the shortage of fuel, large-scale installations are lacking at the moment. This, however, does not eliminate the possibility of considerable activity along this line as facility and equipment needs come to light under the pressure to beat a possible supply shortage in the months to come. In event the flow of coal from the mines improves to the point where existing facilities cannot handle the load, the chances are industrialists will give thought to enlargement of existing equipment, especially in view of the continued threat of instability in coal production.

Storage and handling facilities for coal at Chicago steel plants have not been used to full capacity since before the war started. Until coal mining can be ex-

panded greatly beyond present activity, it is not likely these facilities will be taxed.

During the period that inventories are being built up to the extent that coal availability permits, Chicago district steelmakers are more concerned with proper balance of grades than overall tonnage. For a long time there has been difficulty in obtaining enough low-volatile coal from the West Virginia and Kentucky fields to provide correct blending of charges for coke ovens. It does not seem likely now that satisfactory stocking of low-volatile fuels will be possible for some time to come.

There is little apprehension among industrialists in the Pittsburgh district over steam coal supplies but some concern is expressed with respect to metallurgical coal stocks. The latter has been in tight supply for some time past and with steelmaking operations promising to continue at a high rate far into the future, there appears little prospect for easing in coal supply for coking purposes.

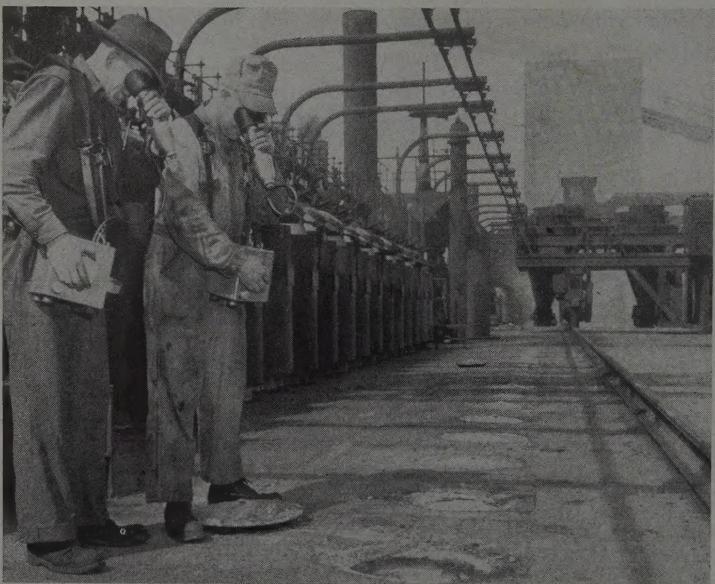
In the main, however, expectations are little trouble will be experienced this winter in the way of shortages—certainly no one anticipates anything like the pinches which have been experienced in recent past winters. Stocks are being built up as rapidly as possible but nothing unusual in this respect is reported.

Oil, Gas Shortages Cause Concern

Of more immediate concern to industrialists at Pittsburgh than coal supply is the threat of gas and oil shortages for industrial purposes. Three major gas distributors in the district last week pointed out that despite increased supplies from the Big and Little Inch pipelines, they expected as severe a curtailment in industrial gas this coming winter as last year. At the same time, spokesmen for the oil industry report the supply of furnace oil already is so low that if a manufacturer hasn't already received a guaranteed standby oil supply, he probably will be out of luck. Manufacturers were warned some time ago to put in standby storage equipment and a good many of them have followed this advice. However some manufacturers hesitate to change over from gas to oil when a shortage of the latter also is threatened.

Coal supplies held by leading industrial consumers in the Cleveland district have been replenished and are now being maintained at normal levels. In most instances, limitation of storage and handling facilities has been the determining factor in the amount held in reserve for use over coming months.

Industrial users of fuel oil and gas in Cleveland have been warned of a threatened shortage this winter. The principal supplier of industrial gas has informed customers use of this fuel will be cur-



VISUAL HEAT TESTING: To help assure huge tonnages of steel to the metalworking industry, these two workmen keep a close eye on the production of coke at the United States Steel Corp.'s Geneva steel plant at Geneva, Utah. Using optical pyrometers, they are checking the heat of coke ovens where coal is held at 2000 degrees 18 hours for conversion into coke. Behind the men are condensers which collect and utilize by-products realized from transforming pulverized coal into coke

tailed during peak demand, the amount depending upon the day of the week, the temperature, the rate of industrial operation and similar governing factors. It has been suggested they install standby equipment where possible and many have followed this advice. Last winter use of industrial gas was ordered cut on 23 days in the district, on some days industrial use being completely cut off.

Some midwestern firms have installed large fuel oil storage tanks and are filling them with residual fuel transported from the southwest in tank cars. Other large industrial users have installed tanks for storage of propane gas which can be converted into natural gas. These reserves generally are adequate for only 10 to 20 days' needs and, therefore, are protection for only short emergency periods. Propane gas supplies are also tight and sellers no longer will enter into contracts for supplying new customers. In many instances, industrialists have installed dual-fuel consumption equipment so that they will be able to switch as the occasion demands.

Youngstown's Inventories Low

Youngstown's busy steel plants, rushed with all the business they can handle, are trying to build up coal supplies which were badly depleted—and they're also boosting fuel oil storage supplies to safeguard operations next winter.

Currently, coal supplies in the area are about the smallest they have been in recent years. The high rate of steel operations plus the coal miners' vacation last July dragged them down, and the mills haven't been able as yet to rebuild any substantial surpluses for the coming winter.

Mills at Youngstown would like to carry one to two months' reserve supplies of coal to safeguard them against work stoppages and other interruptions to operations—and in normal years they do carry such supplies. And they have the storage facilities. However, most Youngstown mills haven't been able to carry such large supplies all during the war and since then because of the numerous work stoppages at the mines or railroads. They're forced to have such big reserves to protect coke producing plants and other facilities against damage in case of extended shutdowns.

Currently a large share of the coal is going to the Great Lakes as cargo coal, and the mills try to build up stocks particularly after the lake navigation season ends.

Youngstown Sheet & Tube Co. and the Republic Steel Corp. have large by-products plants in the area. Sharon Steel Corp. plans to build one at Sharon; Carnegie-Illinois Steel Corp. gets its coke from the Clairton, Pa., byproducts plant and beehive ovens. Carnegie-Illinois, large user of fuel oil, has just put in a

large fuel oil storage plant at its McDonald mills to safeguard it next winter. Youngstown Sheet & Tube is installing one at its Brier Hill Works.

Spokesmen for coal producers at Cincinnati report consumers' agents are in the field bidding for fuel. That means only one thing—somebody is showing anxiety lest there be a shortage of fuel, especially in the better industrial grades, next winter.

The same reports indicate that active bidders are the "Lakes" district on the one side, and export interests in competition. Many of the larger domestic users, however, have already signed contracts. Much of the export tonnage is also covered, as the exporters went into the market first with "top prices."

Not more than 60 per cent of the coal under contract for export is of a grade desired by metalworking industries and steelmakers.

In the Cincinnati district there is demand for coal for stocking purposes, but a part of this trend is due to desire for "normal" inventories, after depletion of stocks last spring during the

miners' holiday. Few interests in the district, however, are expanding their facilities for stockpiling coal. In cases where there is this expansion, the movement may be traced to a change in source of supply, from captive mines to the open market.

No special plans for stockpiling coal are reported at Buffalo so far.

Sharon Steel To Convert Its Lowellville, O., Works

Sharon Steel Corp., Sharon, O., plans to convert its Lowellville, O., works into a high-quality, specialty steel plant, Chairman and President Henry A. Roemer has disclosed.

When Sharon bought Carnegie-Illinois Steel Corp.'s Farrell works, it was reported that the Lowellville facility was slated for abandonment. The plant has a blast furnace of about 450-ton capacity, six 150-ton open hearths and a 30-ton electric furnace. The blast furnace was originally built in 1845.

Present, Past and Pending

■ PENINSULAR COMPANY BUYS GRINDING WHEEL FIRM

DETROIT—Peninsular Grinding Wheel Co. has purchased the Detroit Star Grinding Wheel Co., 75-year-old maker of vitrified grinding wheels, marking the buyer's entry into the vitrified wheel field after specializing in resinoid bonded wheels since 1889. The acquired plant will be extensively modernized and rehabilitated.

■ WICKWIRE'S HARDWARE GOODS SALES MANAGER DIES

NEW YORK—Percy Jenkins, 47, hardware products sales manager, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., died suddenly Aug. 20. In 1946 he was president of the Insect Wire Screening Bureau.

■ MURRAY CORP. STRIKE SETTLED

DETROIT—Settlement of the strike against the Murray Corp. of America was reached last week when the company agreed not to sue the United Automobile Workers-CIO for damages for breach of contract under the new Taft-Hartley labor law and granted 15-cent-an-hour wage increase.

■ HOOVER CO. INTRODUCES ELECTRIC IRON

CANTON, O.—Hoover Co., vacuum cleaner manufacturer, is introducing a cylinder-type vacuum cleaner and an automatic electric iron. Introduction of the iron marks the first time the company has made any home appliance except sweepers.

■ PHILCO BUYS REFRIGERATOR PRODUCING COMPANY

PHILADELPHIA—Philco Corp. has acquired the production facilities and assets of Rex Mfg. Co. Inc., Connersville, Ind., maker of refrigerators, etc.

■ STEEL SHORTAGE TO CLOSE SOME GM PLANTS

DETROIT—General Motors Corp. will close some of its plants this week or next because of shortages of steel, particularly flat-rolled. Not included are Buick, Oldsmobile, Cadillac and General Motors truck and coach plants.

■ FRIGIDAIRE ANNOUNCES PRICE INCREASES

DAYTON, O.—Frigidaire Division of General Motors Corp. has increased retail prices on some of its refrigerators and ranges \$5 to \$15, on its new home laundry \$15, and on some commercial refrigeration and air conditioning products 2 1/3 per cent.

Basing Point Battle Lines Forming

Vigorous fight expected by steel industry in defense of pricing policy under attack by Federal Trade Commission. Proposed change to f.o.b. mill pricing held economically impractical

THE BASING point system of pricing steel got into the headlines again last week when the Federal Trade Commission instituted proceedings against the American Iron & Steel Institute and more than 100 member companies charging various monopolistic practices, including price fixing.

Effect of the action was not exactly eruptive of grave concern among steelmakers for the future of steel pricing practice. While the seriousness of the charges is fully comprehended, nevertheless, steel men, confident they can substantiate the legality of their position, see the FTC move as nothing more than an extension of the attack on the basing point system which has been in and out of the courts since early in the century. After all, attacking basing point pricing has become something of a fetish with the commission which has instituted numerous actions against the practice not only in steel but other industries over the years.

Charge May Have Political Tie-In

Whether the FTC proceeding was instituted at this time to tie in with the Truman administration's effort to force prices down, as has been suggested, of course is purely conjectural, as is also the suggestion that possibly it is a political move designed to give the present government an offset to the Republican political advantages accruing from the activities of the Senate Small Business Committee's Steel Subcommittee, which has been investigating the steel industry, and which subcommittee is dominated by Republicans.

Whatever the case, the joining of the basing point issue is not new. In 1924 the FTC succeeded in forcing the steel industry to abandon the "Pittsburgh Plus" pricing practice (single basing point), at which time multiple point basing came into vogue and has since been steadily expanded to the point where virtually every steel producing center is a base for pricing one or more products. Adoption of multiple basing practice, however, has not satisfied the FTC which has continued to drive for straight f.o.b. mill pricing so that the



FLYING BATHTUBS: Products of the nation's currently large durable goods output, 60 bathtubs and 40 lavatories were sped by air freight recently from the Briggs Mfg. Co.'s Plumbing Ware Division, Detroit, to an Austin, Tex., plumbing supply company. The entire cargo, representing half a railroad freight car in quantity, was handled in a single six-hour trip by a C-46 Commando

matter has been subject for debate in and out of the industry without letup for years. For that matter, final disposition of the original action against the United States Steel Corp. in the "Pittsburgh Plus" case still remains to be concluded, a phase of the case currently being before the Third Circuit Court of Appeals, Philadelphia, presentation of arguments, for and against, being set for some time this fall.

That the steel industry will fight the FTC's current action right through to the Supreme Court goes without saying, and while up to late last week the American Iron & Steel Institute had issued no public statement replying to the commission's charges, it was understood the institute's legal counsel was preparing its case, meanwhile, comment, for the most part, being withheld by the companies involved in the action.

Steel men view the renewed attack on the basing point system as unjustified not only from the angle of its legality, but also from the standpoint of its economic practicality. They point out that complete f.o.b. mill pricing, if forced upon the industry, would result in economic dislocations from which the nation would be years recovering. Long-estab-

lished steelmaking communities would be seriously disrupted economically; competition between individual mills would be very seriously curtailed, in some cases virtually eliminated; local steel producers would be given a virtual monopoly in markets immediate to their plants without fear of outside producer invasion; and further, many steel consuming plants would find it necessary to move existing manufacturing plants from present locations closer to steel mill supply sources in order to be on a competitive basis, insofar as steel supply goes, with manufacturers closer to steel producing facilities.

The point is brought out very clearly by Irving S. Olds, chairman, United States Steel Corp., Pittsburgh, commenting on the latest FTC action. Said Mr. Olds:

"The latest attack by the Federal Trade Commission on the basing point method of marketing steel products is essentially the same accusation of collusive price action as has been made by the commission in earlier years.

"In our opinion, the basing point charges now made have no more basis in fact or in law than the similar unfounded accusations advanced by the

Commission in our basing point hearings before the Temporary National Economic Committee in 1939 and 1940.

"It was testified in those hearings that the basing point practice of delivered prices in the steel industry is not a collusive or illegal arrangement, but on the contrary is a method of marketing steel products which has evolved over the past 50 years or more as a natural consequence of the fundamental economic and competitive conditions existing in that industry.

"As a substitute for the present marketing practice so developed over the years without agreement or conspiracy, the Federal Trade Commission seems to propose a uniform f.o.b. mill price system, to be established arbitrarily. Under such a system, the net return to a steel mill per ton of product would necessarily be the same on a sale to a customer 100 or more miles away as on a sale to a customer in the same locality. As a consequence, the competition which now exists between a steel mill near the customer and another steel mill or mills more distantly located would be eliminated. Each mill would be restricted in distribution to a limited area surrounding the mill. Each customer would be confined to a single or a very few sources of steel supply, instead of being able as formerly to deal with a number of steel companies. Capacities of steel mills would have to be limited to the consumption in the prescribed territories. Serious dislocations in the steel industry and chaotic conditions in steel consuming industries appear bound to result from the imposition of such an untried and extremely complex and uneconomic system. Local steel monopolies and higher assembly and steel production costs would displace the present widespread competition and production costs in the steel industry."

FTC Charges Conspiracy

In its latest complaint the FTC charges virtually all the important iron and steel producers in the nation with illegal combinations and conspiracy to fix and maintain identical delivered price quotations, and to restrain and destroy competition in the sale of iron and steel products. Significantly, the steelmakers are charged with violating Section 5 of the Federal Trade Commission Act, not the Sherman antitrust law.

"Matching" of delivered price quotations through concurrent use of a multiple basing-point system of pricing is one of the principal points in the action.

The complaint is directed generally against all members of the Institute, but names specifically 26 corporations as respondents, including United States Steel Corp. and eight subsidiaries, in-

cluding American Steel & Wire Co., Cleveland; American Bridge Co., Carnegie-Illinois Steel Corp., National Tube Co., Pittsburgh; Columbia Steel Co., San Francisco; Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; Virginia Bridge Co., Roanoke, Va.;

Bethlehem Steel Corp., New York, and three subsidiaries, Bethlehem Pacific Coast Steel Corp., San Francisco, Bethlehem Steel Co. of Pennsylvania, Bethlehem, Pa. and Bethlehem Steel Co. of Delaware;

Republic Steel Corp., Cleveland, and two subsidiaries, Truscon Steel Co., Cleveland, and Fretz-Moon Co., Butler, Pa.;

Youngstown Sheet & Tube Co. and subsidiary, Youngstown Metal Products Co., both of Youngstown, O.;

National Steel Corp., Pittsburgh, and subsidiaries, Weirton Steel Co., Weirton, W. Va., and Great Lakes Steel Corp., Detroit;

Inland Steel Co., Chicago, and subsidiary, Milcor Steel Co., Milwaukee;

Jones & Laughlin Steel Corp., Pitts-

burgh; American Rolling Mill Co., Mid-dletown, O.; Wheeling Steel Corp., Wheeling, W. Va.

The producers named are said to represent approximately 80 per cent of the nation's total steel ingot producing capacity. The complaint traces widespread operations of the respondent producers, and alleges that except for their activities in the alleged conspiracy, "they would be in active and actual competition with each other as to price and as to matters directly and substantially affecting prices."

Instead, the FTC charges, for many years the respondents have "collectively composed, published and announced prices" and also "systematically exchanged and interchanged information among themselves calculated to enable them to formulate and carry out a non-competitive price policy."

The Commission attacked use of the present multiple basing point system on the ground that its operation according to plan insures "the same identity of

(Please turn to Page 156)

Adequacy of Steel Capacity To Support Full Employment Questioned by Senate Group

QUESTION which Senator Edward Martin (Rep., Pa.) proposes to ask 11 steel company executives invited to appear before his Steel Subcommittee on Sept. 12 is: "What can and should the steel industry do to help toward the full employment goal?"

The senator is not satisfied with assurances that there will be steel enough to go round after the immediate post-war hump is over and demand recedes to "normal." To his mind this implies that there will be sufficient steel at such time as the demand is insufficient to maintain full employment. This concept, Senator Martin feels, is inadequate.

He plans to build a fire under the steel men by having two strong full employment advocates before his committee on the preceding day, Sept. 11. Both are labor leaders, one being Philip Murray of the CIO and the other William Green of AFL. The gist of their testimony will be: There is not enough steel capacity to support full employment—period.

The senator is going to give their arguments very considerate attention, for he has been much worried about the complaints received by his subcommittee every day—complaints telling about companies closing down and men being laid off their jobs for lack of steel. Besides, the AFL and the CIO swing a lot of votes in Senator Martin's state of Pennsylvania.

Interrogation of the steel company

executives on Sept. 12 may be only a curtain-raiser to a full-fledged investigation of all phases of capacity, production, financing, and distribution of steel. Such an investigation would be beyond the authority of Senator Martin's subcommittee, which is a subsidiary of the Senate Small Business Committee. Current likelihood is that the full-dress investigation of steel, if made, will be conducted by the Joint Congressional Committee on the Economic Report of which Senator Robert A. Taft (Rep., O.) is chairman.

This matter has not yet been decided but the Joint Committee on the Economic Report is the one with the special problem of mitigating, if possible, the impact of the next depression—and the investigation of steel would be launched with this in mind.

The 11 steel men invited to appear before the Martin subcommittee on Sept. 12 are: Benjamin F. Fairless, United States Steel Corp.; E. G. Grace, Bethlehem Steel Corp.; T. M. Girdler, Republic Steel Corp.; Ben Morell, Jones & Laughlin Steel Corp.; Frank Purnell, Youngstown Sheet & Tube Co.; Ernest T. Weir, National Steel Corp.; Wilfred Sykes, Inland Steel Co.; Charles R. Hook, American Rolling Mill Co.; Henry A. Roemer, Sharon Steel Corp.; A. J. McFarland, Wheeling Steel Corp.; and Hiland G. Batcheller, Allegheny Ludlum Steel Corp.

Car Builders Say Need Is for Balance in Materials Supply

Railway car institute, replying to threat of Senate probe of freight car output, says production schedule calls for 10,000 cars in September if materials are available, but asserts the industry has not received all the steel senator says it has

GIVE us a balanced supply of essential steel and parts in volume and we will turn out the freight cars needed to bring the railroads' rolling stock to a point that will meet the unprecedented peacetime traffic demands of industry.

That in effect is the answer of the freight car builders to a threat of Sen. Clyde M. Reed (Rep., Kans.) to launch an investigation of the car building industry in an effort to determine why the freight car program has failed to come up to projected schedule.

Replying to Senator Reed's charges that the car builders have not been producing cars in the volume which steel supply would permit, S. M. Felton, president, American Railway Car Institute, New York, last week pointed out that while the figures on car steel supply cited by Senator Reed may reflect accurately the overall steel tonnage shipped the car builders and railroads, a survey of the car builders (last week of July) showed clearly that they have been receiving no such quantities as were indicated by the senator.

In an earlier statement Senator Reed had charged that in the first seven months of this year about 28,000 freight cars were retired for obsolescence in comparison with only 25,000 new cars built while deliveries of steel for car building was sufficient for approximately 60,000 new units.

Car Builders Blamed

"The country today," said Senator Reed, "is at least 15,000 to 20,000 cars behind the new freight car production it needs and should have. Some of this responsibility may be with the railroads, but most of it is with the car builders. The sole responsibility of the Senate committee is to get a satisfactory car building program under way. That responsibility will be met."

In reply to Senator Reed, Mr. Felton said: "Freight car deliveries have risen from 2293 in February to 5514 in June and 5879 in July."

Freight car deliveries by months for 1947 follow:

Jan.	2982	May	8929
Feb.	2293	June	5514
Mar.	2883	July	5879
Apr.	4123	Total	27603

"Indications, based upon reports given

them has persistently hampered freight car production.

Concerning the question where the steel has been going, Mr. Felton suggested that "it is possible that the steel which we have not received has been shipped to railway shops, in which case a substantial portion would have gone for repair and maintenance of over-age rolling stock. While such would not show up in new car production, it nevertheless would help alleviate the freight car shortage and thus be in the national interest," he explained.

"The obvious fact," Mr. Felton asserted, "is that the car builders are in business to build cars. For the first time in years they have orders on their books for the future and the railroads have stated that additional orders will be placed."

"It is difficult, therefore, to understand why Senator Reed would speculate that the car builders are slowing down production and not utilizing materials as fast as complete car sets are received, or that they do not have the same problems as have prevented other manufacturers from meeting consumer demands," Mr. Felton said.

The concern over the flow of new freight cars to the railroads stems from the fact there has been a decline in the number of cars in service at a time when



LINE PRODUCTION: First of the Vista-Dome railroad passenger cars built on the assembly line of a railroad car manufacturer for regular service are being completed for the Burlington Railroad by the Budd Co., Philadelphia. Each car has a second-story observation section for 24 passengers. NEA photo

Industrial production is high and the need for cars is great. According to the U. S. Department of Commerce, there were about 24,000 fewer cars in operation in the first four months of 1947 than in 1945, the year the war ended. Average for the first four months of 1947 was 1,735,714. Meanwhile, car loadings this year through the week ended Aug. 9 totaled 26,773,222, compared with 24,220,205 in the corresponding period of 1946 and 26,391,742 in the like period of 1945, according to the Association of American Railroads.

The current shortage of railroad freight cars dates back to the first World War, from which the carriers emerged with badly worn equipment. Although 175,748 cars were produced for domestic use in 1923 they did little more than replace cars that were scrapped. During the depression years of the 1930s, deliveries of freight cars declined to an average of about 29,000 cars annually, and compared unfavorably with the average of 84,000 cars yearly from 1920-1929.

The nation entered the second World

War with 715,000 fewer cars than it had at the end of World War I.

After the war, the railroads did not order cars immediately. Labor and materials costs were rising and it was feared that a falling volume of traffic would seriously affect the carriers' financial condition. The railroads petitioned for a freight rate increase, which was granted, effective Jan. 1, 1947. After this, orders for new cars increased considerably.

Backlog of cars on order on Aug. 1 was 117,592. Of these, 87,518 are with car builders and 30,074 with railroad shops. New orders placed in July totaled 14,865 freight cars, 12,840 being ordered from car builders and 2025 to be built in railroad shops.

Republic To Build Mill For Large Diameter Pipe

Republic Steel Corp., Cleveland, to help meet the huge demand for large diameter pipe for pipe lines, is planning construction of a mill to produce this

product at its plant in Gadsden, Ala. Engineering of the project is under way and expectations are that the pipe mill will be in operation by June, 1948.

The new mill will produce electric welded steel pipe in diameters from 20 to 30 inches and in 30-ft lengths. The pipe will be made from plates rolled on Republic's Gadsden plate mill and will be cold formed before welding.

Two buildings to house the mill will be built adjacent to the Gadsden facility.

Bethlehem Steel Acquires 900 Acres Near Baltimore

Bethlehem Steel Co., Bethlehem, Pa., last week announced it had acquired approximately 900 acres of land in the Patapsco river neck area near Baltimore "for eventual use in connection with the Sparrows Point plant and other industries." A company statement said "the property affords extensive possibilities for piers, docks and other shipping facilities."

SHIPMENTS OF FINISHED STEEL PRODUCTS FOR JUNE AND YEAR TO DATE

Steel Products	Number of companies	Items	JUNE - 1947			To Date This Year			Whole Year 1946		
			Net Shipments (Excluding Sales to Members of the Industry for Conversion into Other Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Other Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Sales to Members of the Industry for Conversion into Other Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Other Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Sales to Members of the Industry for Conversion into Other Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Other Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	234,806	4.5	208,771	1,325,962	4.3	1,123,585	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	364,295	6.9	398	2,224,063	7.1	1,807	3,474,284	7.1	5,399
Steel piling	3	3	27,475	0.5	-	160,760	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	563,354	10.7	18,457	3,135,342	10.1	109,260	4,152,181	8.5	250,709
Skelp	6	5	16,119	0.3	31,231	88,274	0.3	195,415	227,035	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	188,168	3.6	198	1,117,182	3.6	462	1,790,311	3.7	4,890
—All other	5	7	17,112	0.3	-	95,910	0.3	167	144,999	0.3	426
Joint bars	7	8	13,815	0.3	1,337	92,280	0.3	7,559	176,803	0.4	5,327
Tie plates	8	9	46,488	0.9	119	253,871	0.8	2,977	447,496	0.9	18,700
Track spikes	8	10	13,969	0.3	20	89,773	0.3	74	146,194	0.3	693
Hot Roiled Bars—Carbon	33	11	501,060	9.5	64,183	3,166,485	10.2	398,887	5,006,859	10.3	707,991
—Reinforcing—New billet	16	12	109,392	2.0	611	617,246	2.0	4,303	1,048,483	2.1	7,381
—Rerolled	11	13	13,967	0.3	-	76,848	0.2	-	141,346	0.3	1,267
—Alloy	27	14	156,531	3.0	19,989	912,282	2.9	110,511	1,390,278	2.8	138,395
—Total	45	15	780,950	14.8	84,783	4,772,861	15.3	513,701	7,866,966	15.5	855,034
Cold Finished Bars—Carbon	29	16	116,875	2.2	841	788,953	2.5	4,492	1,316,579	2.7	2,428
—Alloy	26	17	17,901	0.3	192	127,276	0.4	902	196,237	0.4	1,725
—Total	35	18	134,836	2.5	1,033	916,529	2.9	5,394	1,512,816	3.1	4,153
Tool steel bars	19	19	6,586	0.1	522	48,089	0.2	2,750	96,020	0.2	371
Pipe & Tubes—Butt weld	15	20	148,099	2.8	5,341	833,737	2.7	32,628	1,276,289	2.6	45,393
—Lap weld	8	21	30,828	0.6	33	200,488	0.6	658	305,516	0.6	238
—Electric weld	11	22	99,887	1.9	10	499,029	1.6	990	674,459	1.4	591
—Seamless	10	23	178,030	3.4	12,543	1,048,559	3.4	73,846	1,871,540	3.8	83,441
—Conduit	7	24	13,500	0.2	835	70,278	0.2	4,299	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	56,670	1.1	1,644	* 329,136	1.0	10,294	429,180	0.9	3,478
Wire rods	23	26	59,220	1.1	27,436	330,516	1.1	162,465	679,998	1.4	346,506
Wire—Drawn	38	27	218,954	4.2	14,960	1,289,427	4.1	91,342	1,933,124	4.0	135,592
—Nails and staples	18	28	63,532	1.2	276	427,880	1.4	4,110	636,632	1.3	797
—Barbed and twisted	15	29	21,081	0.4	11	125,148	0.4	24	207,610	0.4	-
—Woven wire fence	13	30	33,207	0.6	246	208,779	0.7	1,874	383,230	0.8	-
—Bale ties	12	31	10,721	0.2	-	62,096	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	62,710	1.2	205	414,082	1.3	1,442	781,167	1.6	3,179
—Chemically treated	8	33	661	-	-	14,282	0.1	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	167,069	3.2	-	967,251	3.1	228	1,924,657	3.9	-
—Electrolytic	9	35	140,931	2.7	-	733,181	2.5	529	905,173	1.9	-
Sheets—Hot rolled	30	36	582,030	11.1	45,551	3,574,699	11.5	296,270	5,521,463	11.3	421,198
—Cold rolled	17	37	460,980	8.7	2,340	2,687,427	8.6	12,613	4,075,554	8.4	3,397
—Galvanized	16	38	130,542	2.5	3	781,802	2.5	192	1,462,053	3.0	1,725
—Electrical and enameling	10	39	51,122	1.0	-	285,594	0.9	307	435,170	0.9	-
Strip—Hot rolled	23	40	141,121	2.7	19,654	868,706	2.8	144,958	1,363,812	2.8	237,176
—Cold rolled	34	41	138,125	2.6	1,506	813,064	2.6	14,426	282,146	2.6	25,904
Wheels (car, rolled steel)	5	42	31,055	0.6	-	187,332	0.6	2	252,308	0.5	348
Axes	5	43	15,663	0.3	-	90,028	0.3	53	130,461	0.3	221
All other	44	-	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	141	45	5,263,711	100.0	479,463	* 31,172,157	100.0	2,816,720	48,775,532	100.0	4,297,889

*Adjusted.

Withdrawal of Standby Tools Eases WAA's Job

Number of unsold machine tools reduced by JANMAT program's authorization. Remainder to pose sales problem

REMAINING machine tool disposal job of the War Assets Administration will be eased materially as a result of congressional authorization of the JANMAT program. So far, the War Department has given shipping instructions on 8700 tools and the Navy on 6900. That leaves 76,400 tools still bearing JANMAT tags, and War Department and Navy officials under the law have until next January to decide what tools they actually will take over for standby purposes.

Whether the services will take over all these 76,400 tools is a moot question. The chances are that the standby programs will be reduced somewhat. These are the reasons:

1.—The military largely has abandoned plans to preserve single-purpose special tools, and is concentrating on putting standard, general-purpose tools in standby.

2.—But the military does not wish to let its standby programs prevent private industry from procuring its needs.

3.—Further, military spokesmen point out that there are advantages in putting a strategic tool in a plant where it will be kept in good operating shape as compared with taking it apart and putting it in storage.

4.—Putting tools in storage costs money, and the services do not care to divert any more of their funds to this purpose than necessary.

As to the task still ahead of the War Assets Administration, the number of surplus government-owned machine tools still unsold is 122,000. If the services take the 76,400 tools still bearing JANMAT tags, that leaves 45,600. In addition, as remaining complete war plants are broken up for sale, about 80,000 more tools will be added to WAA's inventory.

In one way the outlook seems much easier in that the number of unsold tools is being so vastly reduced. But in another way the outlook for the clean-up in the first half of next year presents difficulties because the inventory remaining next year will consist mostly of tools which are not completely general-purpose. A large part of the inventory still remaining will comprise tools of "limited purpose"—that is, such tools as



GUIDE FOR VISITORS: Exhibit which the Monarch Machine Tool Co., Sidney, O., is setting up for the National Machine Tool Show at Chicago, Sept. 17-26, is so large the company had this 19-foot model built as a guide for visitors to its booth. Small-scale replicas of the machines are shown exactly as they will be located in the more than 8500 square feet of space Monarch has taken for its display. Company executives examining the model are, left to right: Wendell E. Whipp, board chairman; Jerome A. Raterman, president; Kermit Kuck, chief engineer; Stanley A. Brandenburg, general sales manager; Fred Dull, treasurer; A. J. Sherman, factory superintendent; and D. H. McKellar, vice president

thread grinders, gang drills, etc., for which there is no wide demand.

sales, and G. F. Koehler, general manager of HPM's subsidiary, Hydro-Power Inc., Springfield, O.

New Machines Introduced By HPM at Editorial Forum

Hydraulic Press Mfg. Co., Mt. Gilead, O., has entered the small press field with an all-hydraulic, high-speed inclinable 50-ton press, designed to perform a wide range of operations, including embossing, shallow drawing, blanking, flanging, hole piercing, etc. The press is equipped with a pneumatic control system and operates at over 100 strokes per minute.

The press was introduced to editors of industrial publications at an editorial forum Aug. 15, along with other new equipment.

Hosts included Col. H. A. Toulmin Jr., chairman, president and general manager; P. C. Pocock, vice president in charge of

WAA Cancels 1400 Dealer Agreements; Ups Discount

War Assets Administration has extended the recently announced 17½ per cent discount on certain types of surplus machine tools purchased for resale to all standard general-purpose tools, except those in critically short supply. The action was taken at the same time notices were sent out to some 1400 "approved dealers" cancelling their dealership agreements effective Aug. 31.

These dealers have been receiving a 12½ per cent commission for finding customers for certain types of surplus tools. They will, however, become eligible for the discount by certifying that their purchases are made for resale.

WAA Officials, Dealers Discuss Tool Sales Plan

Precedent-setting meeting held in Cleveland clarifies new disposal program. Advisory committee of dealers to be elected

MACHINE tool dealers and officials of the Cleveland region of War Assets Administration last week held the first meeting of its type in WAA's history. Called to acquaint dealers with the region's new program to speed liquidation of the country's largest inventory of machine tools and other industrial equipment, the meeting Aug. 20 in Cleveland's Hotel Allerton was attended by close to 100 dealers and their representatives.

Because the largest portion of WAA's sales of metalworking tools and equipment is made through these dealers, officials of the disposal agency presented a program designed to cover all aspects of the new "one-stop" service which has been set up to speed inspection, selection and sale of surplus equipment.

Under the new plan, which is to be used throughout Zone 3 and which originated in the Cleveland region, tools and other equipment will be sold only through catalog offerings, and the sales will be consummated at the Customers Service Center where the tools are located.

In explaining the new arrangement to the dealers, Col. James H. Frier Jr., Cleveland regional director, admitted that "everybody knows how difficult it was to do business with WAA. It was a constant headache," but stressed that the sales process has been streamlined and that many of the shortcomings of the agency have now been ironed out. Sale of the Cleveland region's inventory of \$72,606,000 worth of machine tools and industrial equipment should provide dealers with profits of approximately \$4,500,000, he said, adding: "We are out to help you make money, because that is the way we can liquidate the inventory."

John Mathews, deputy regional director, explained the change which will be made in discounts on tools purchased for resale effective Aug. 31. Previously "approved dealers" operating under agreements with WAA had been granted a 12½ per cent commission on sales. Under the new plan, which is nationwide, tool rebuilders, manufacturers, exporters, dealers and other distributors who buy for resale are eligible for



DR. HERBERT BLUMER

17½ per cent discounts on fixed price tools. Studies are being made on extending the discounts to Clayton-formula priced tools also, Mr. Mathews said.

"The Machine Tool Inventory and Where Located" was the subject of an address by J. Lloyd Littleton, chief, Machine Tool Division, who enumerated the categories included in the more than \$72-million verified inventory. Machine tools, Mr. Littleton said, constitute \$45.5 million of the total, and metal cutting and forming equipment accounts for \$8.5 million. Other metal processing machinery is valued at \$5 million, with the groups of electrical equipment, materials handling machinery and industrial furnaces each valued at approximately \$3.5 million. Metal cutting and testing equipment is valued at \$1,750,000 and heat-treating furnaces at \$1 million. Special industrial equipment, the smallest category, is worth \$388,000.

Fourteen catalog sales of some of this material are now being held and 18 more are to be started in another week.

In the discussion period which followed the addresses, Colonel Frier asked that the dealers elect an advisory committee to act with the regional WAA office in solving some of the dealers' problems and in making known to WAA certain marketing conditions which the dealers, better than WAA, know. This advisory committee, he said, can help the agency set prices for certain single-purpose war tools for which prices have never been established in the open market. Tools, when not sold at a fixed price during one sale are subsequently offered at the same price at a latter sale, he said; however, from the advice such an advisory committee could give the agency, more realistic prices could be set on some of the hard-to-sell items.

All dealers in the region are to be notified of a nominating committee's choice for a five-man group to advise WAA, and will vote in the near future to select the committee.

Blumer Leaves U. S. Steel Board Of Arbitration

Chairman returns to university professorship. Successor to be Ralph T. Seward, umpire in auto labor relations

MARKING the first personnel change in the three-man joint United States Steel Corp.-United Steelworkers of America, CIO, arbitration board since formation two years ago, Dr. Herbert Blumer, chairman, has resigned and will return to his university teaching job.

Dr. Blumer, who has been on leave from his professorship of sociology at the University of Chicago, will be succeeded in the chairmanship of the arbitration board by Ralph T. Seward of Detroit. For the last three years, Mr. Seward has been permanent umpire under an agreement between General Motors Corp. and the United Automobile Workers-CIO. Mr. Seward will assume his new duties Oct. 1.

Other members of the U. S. Steel-United Steelworkers arbitration board are the corporation's representative, Walter J. Kelley, manager of industrial relations of the corporation's subsidiary, the Tennessee Coal, Iron & Railroad Co., and Eugene Maurice, a Johnstown, Pa., district director of the Steelworkers, who represents the union.

The 1945 wage and hour contract between U. S. Steel and the United Steelworkers set up the board as a further effort to cement management-labor relations. The body was empowered to act as an appeal group so that grievances not settled in the regular channels could go to the arbitration board for final settlement. One member was appointed by the corporation and one by the union. The third man, the chairman, was mutually agreed upon.

The arbitration board, whose formation was an innovation in the basic steel industry, has, since its inception, handled 501 contract grievances from employees, but has ruled out half of them as improper.

Gray Iron Founders To Meet Oct. 2-3 in Milwaukee

Gray Iron Founders' Society Inc., Cleveland, will hold its annual meeting Oct. 2-3 at Hotel Schroeder, Milwaukee.

Featured at the gathering will be elections of officers and directors, business sessions and committee conferences.

Battle royal over Reciprocal Trade Act expected next year when law comes up for renewal unless Truman administration sharply alters foreign trade policies. Veto of minerals subsidy bill arouses fresh resentment in Congress

UNLESS the administration sharply alters its present policies in regard to foreign trade—and there are no indications whatever that it intends to do so—a battle royal is sure to develop at the 1948 session of Congress when the Reciprocal Trade Act comes up for renewal. Its present expiration date is Apr. 30, 1948. The Republican leaders intend to make another determined fight to amend the law so as to give Congress rather than the administration final decisions on proposed tariff changes.

The present majority party has been opposed to the reciprocal trade agreements policy since the act first was enacted in 1934. Recent developments have done nothing to lessen this attitude. Widespread hostility at Geneva to our demand for elimination or modification of old-time trade barriers, and insistence by the British on retaining the Empire-preference system almost wholly intact, have been received in a bad light by members of Congress. There are suspicions in numerous quarters that the help-to-Britain program just ahead may look like a bad deal if and when the expected severe postwar depression materializes in the United States.

Trade Walls Prevalent

In talking to newspaper men, Rep. Daniel A. Reed (Rep., N. Y.), influential member of the House Ways and Means Committee which will do most of the shaping of the trade act to be passed next year, emphasized the fact that "every nation is setting up trade barriers to protect itself," and "unless we get some evidence that it is not going to be all one-sided, the Reciprocal Trade Agreements Act will be extended only with the greatest reluctance."

Another important majority member of the Ways & Means Committee, Rep. Bertrand W. Gearhart (Rep., Calif.), proposes a straight policy of trading our surpluses for "things we haven't got but which other countries have in plenty." His criticism is: "The State Department seems to have the idea that the reciprocal policy means differentiating between essential and less essential industries and letting the latter go by the boards."

Present attitude of Republican leaders favors an amendment that would give Congress the power to approve or nullify any trade agreement made by

the State Department. They feel such a change is necessary to protect thousands of small business men who have been complaining about ill effects of reciprocal deals affecting individual commodities with which they are concerned.



GEN. JOSEPH L. COLLINS

Post of deputy chief of staff of the War Department will be assumed by General Collins, Sept. 1. The 51-year-old general, who fought in the South Pacific and Europe during the last war, was relieved recently of his duties as chief of information so he could prepare to take the new job. NEA photo

Conservation Views Clash

The President's veto of H. R. 1602 has aroused fresh resentment. This is the bill which, by government subsidies, would have kept copper at 28 cents and lead and zinc at 18 cents to keep submarginal mines going. It also would have added manganese to the subsidy program by supporting a price of \$1 a unit of metallic manganese contained.

One of the things that is going to result in trouble for the administration next year is the President's statement, in vetoing H. R. 1602, that "continuation of the wartime subsidies would clash with

the country's peacetime objective of conserving domestic mineral resources." The majority of congressmen, as shown by votes on various occasions, are firmly against a policy of conservation. Primarily such a policy is not a political asset, in view of the always insistent demands of submarginal mine owners for government handouts. On the other hand, entirely aside from politics, there is a widespread feeling among congressmen that a consistent policy of conservation discourages exploration, and prevents discovery and development of many new mineral properties.

Here are some of the highlights at recent hearings of the House Public Lands Committee which will have a bearing on mineral policy determination next year:

1—Dr. Elmer W. Pehrson, Bureau of Mines, said: "We have very meager information on our potential mineral resources." To do a thorough job of exploration, he said, would cost several billion dollars and require a number of years—and a thorough job cannot be done for anything like the \$16 million appropriated for the present fiscal year.

2—H. C. Maull Jr., of the Treasury Department, Bureau of Federal Supply, testified that 85 per cent of the materials being stockpiled at the instructions of the Army & Navy Munitions Board (now the Munitions Board) come from abroad and only 15 per cent from domestic producers.

Members of the committee charged that this policy was exactly contrary to congressional intent as provided for by the Buy American Act under which government agencies may pay a premium of 25 per cent—and more when consistent with the national interest—for materials of domestic origin, and as provided for by the clause in the Stock Piling Act under which government agencies may allow one year for development purposes after placing an order with a potential domestic producer, and under which they may place contracts without requiring the vendors to give the usual bonds.

3—Dr. Pehrson estimated that whereas known manganese reserves in the United States were less than 500,000 tons in 1910, they now are sufficient to meet the requirements of our steel industry for "over 100 years," despite the fact that in the meantime the shipments of ore from our mines has aggregated nearly 10 million tons. J. Carson Adkerson, president of the American Manganese Producers Association, told the committee that this story was a good example of what happens under a program of development and use rather than of conservation. Mr. Adkerson further pointed



Auxiliary Engine
Turbine Blade

Shrouded Gas
Turbine Blade

Turbine Blade

Axial Flow
Compressor Blade

Turbine Wheel

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out that 182,000 tons of domestic ore shipped in 1945 contained an average of 56.7 per cent metallic manganese, compared with an average of 48.3 per cent in the foreign ore.

4—General S. P. Spalding, deputy executive chairman (Army) of the Army & Navy Munitions Board, told the committee that the policy of the board is to buy material where it is available. But he made it clear that the board has not undertaken to encourage development of domestic mineral properties. Explaining the preponderance of foreign materials in the stockpiling purchase program, General Spalding said that (a), the only materials being stockpiled are those of which we have not an adequate supply at home and (b), priority is given to foreign materials which might be cut off in case of the sudden outbreak of another war. General Spalding declared that he would oppose an amendment which would say how much of the material to be stockpiled should be bought from domestic sources.

5—Various owners of manganese properties declared that the specifications of the Bureau of Federal Supply, as set up by the secretaries of War, Navy and Interior through the Munitions Board, are discouraging to domestic producers. Some ores are ruled out by phosphorus and others by silica and alumina. It was pointed out that for purposes of private industry the different ores are blended—and congressmen felt that to encourage the domestic industry the government can and should resort to such blending.

6—Dr. Pehrson testified that our present reserves of chromite are sufficient for the country's needs for at least 25 years, and that this ore could be made usable by development of processes through research. Also, the size of the reserves might be increased as a result of further explorations.

7—Mr. Maull testified that in entering the market for minerals to be stockpiled the Bureau of Federal Supply sends out invitations only to a list of suppliers set up by the interested government authorities. However, "anyone" can get his name on this list by supplying information as to his ability to furnish desired materials. Members of the committee contended the whole practice reflected the overall administration policy of favoring foreign sources when buying minerals.

8—Dr. Pehrson estimated that an adequate stockpiling program would entail a layout of some \$5 to \$6 billion—instead of \$100 million so far appropriated.

Adding up all these expressions, it is a foregone conclusion that the shaping of a minerals program will be an important subject at the next session, and that the administration will have to advance much stronger arguments than up to the present to make its mineral conservation

program stick. Right or wrong, the Congress according to all present indications is going to vote for a wide-open policy of minerals exploration and development, with liberal appropriations for such a program.

In view of what the wool bloc, with a lot less ammunition to work with, did at the last session for wool, it is clear that the minerals-minded congressmen are in a strong position to fight the conservation-minded administration.

Warning To Scientists

Fresh warning to scientists, engineers and industrialists that it continues unsafe to take chances with the security provisions of the Atomic Energy Act is seen in the refusal of the Atomic Energy Commission to give to Dr. Robert J. Moon "any assurance or guarantee that his future actions will not involve a violation of the Atomic Energy Act." Dr. Moon, University of Chicago nuclear physicist who worked on the Manhattan project, has an offer of the chairmanship of the physics department at a Canadian university and fears that acceptance might open him to prosecution under the provision which authorizes the death penalty for disclosure of restricted atomic information outside the country.

House Launches Patent Study

The House Small Business Committee has launched a study of the recent report of the attorney general entitled "Government Patent Practices and Policies." In this report, it will be recalled, the attorney general made this basic recommendation:

"Where patentable inventions are made in the course of performing a government-financed contract for research and development, the public interest requires that all rights to such inventions be assigned to the government and not left to private ownership of the contractor."

The attorney general suggested certain exceptions, as "to permit the contractor to retain the patent rights to inventions to which he has already made a substantial independent contribution," but held that even in such cases the government at the least should be given a free license.

The committee, says Rep. Walter C. Ploeser (Rep., Mo.), its chairman, wants to find out what government patent policy would be the best from the standpoint of encouraging small business. First step has been the sending out of a questionnaire to a great many business firms. The result will be tabulated and studied by a staff headed by J. G. Crost. Possibly hearings may be scheduled to pursue the study in the fall; in any event

a report eventually will be written and submitted to Congress.

The study also will embrace contemplated final revisions of the patent clauses of the War and Navy Departments. Both departments will send out to contractors, scientists, trade associations and interested parties copies of the recommended new patent clauses, and criticisms and suggestions will be invited. These letters probably will go out in September. Capt. G. N. Robillard is the new patent counsel for the Navy Department, while Col. George W. Gardes has charge of the program for the War Department's judge advocate general.

Congressmen Travel Abroad

Following the notice recently served by House Majority Leader Charles A. Halleck (Rep., Ind.) that the House intends to be recognized as "a full fledged partner in foreign affairs," no fewer than 19 House committees have assigned members to travel abroad this summer. Chosen largely following consultation with Speaker Joseph W. Martin Jr. (Rep., Mass.), their assignments have been such as to give them specialized knowledge in various subjects concerned with the general field of our foreign interests. Special attention will be paid to European relief needs, policy toward Russia, international trade, economic shortages, problem of finance, and international aviation. The travelers include Republicans and Democrats in the same ratio as reflected in the membership of the House.

Consolidated Defends Sale

Consolidated Steel Corp., Los Angeles, has filed a brief in U. S. District Court in Wilmington, Del., contending "there has been no showing" that its proposed acquisition by Columbia Steel Co., San Francisco, would be "detrimental or prejudicial to public interest" and "consequently there will be no restraint of trade within the meaning of the Sherman Act."

Wants U.S. Ships Scrapped

Recent proposal by Henry J. Kaiser that he scrap 1000 merchant ships to increase the scrap supply is viewed skeptically in San Francisco. In the first place, it is pointed out, a complete reversal of government policy would be necessary to make that many vessels available.

Under present laws, all ships in good condition must be placed in a national defense reserve. The Army and Navy must give permission to sale of vessels for scrapping, and the Maritime Commission cannot sell ships for that purpose if they are certified in good condition by the Army and Navy.

Ground Broken For Atomic Pile At Brookhaven

Pile, to cost \$10 million, will be used for research activities. Oak Ridge reactor seen dwarfed by new unit's power

WORK has begun at Brookhaven, Long Island, N. Y., on the first atomic-energy pile to be built in peacetime. Costing \$10 million, the unit is expected to be completed within a year.

The new pile will be used for fundamental research in physics, biology, medicine, chemistry and engineering, and, while similar to the Oak Ridge, Tenn., nuclear reactor, will have several times greater neutron density. It will provide a neutron source and testing ground for from 200 to 500 scientists in northeastern states, the largest pool of atomic talent in the country.

To be operated by Associated Universities Inc., an organization formed by nine eastern schools, the project will be government-owned and financed. H. K. Ferguson Co., Cleveland, which built the Oak Ridge thermal diffusion plant, is in charge of construction.

The pile will be air-cooled, concrete-shielded and housed in a brick building 100 x 120 feet, six stories high, flanked by two wings, each containing laboratories. The length of the entire structure will be 600 feet.

Ground Breaking Attended by 500

Ground breaking was attended by a special ceremony, with 500 spectators present. The unit will be located on a one-acre clearing in the center of a 6000-acre reservation, formerly the Army's Camp Upton. Dr. Lyle B. Borst, director of the pile, manipulated the controls of the power shovel which broke the ground. Among observers were Sumner T. Pike and William W. Waymack, members of the United States Atomic Energy Commission, and such atomic experts as Dr. Harold C. Urey and Dr. I. I. Rabi, Nobel prize winners, and Dean George B. Pegram of Columbia University.

While the project will represent the greatest effort yet made to harness atomic energy for the benefit of mankind, Mr. Pike warned that the principal job of the Atomic Energy Commission is still "to produce bombs. And," he added, "it will probably be our principal responsibility for a long time."

Dr. Borst pointed out that while the



Models of buildings to be erected at Brookhaven National Laboratory, Brookhaven, N. Y., nuclear research center where a \$10 million atomic energy pile, first ever to be built in peacetime, will be constructed, are being examined by the above four scientists. Left to right are: Dr. Lyle B. Borst, head of the nuclear reactor project; Sumner T. Pike and William Wesley Waymack, members of the Atomic Energy Commission; and Dr. Philip M. Morse, director of Brookhaven. The pile and connecting laboratories are expected to be operating by mid-1948. NEA photo

new atomic pile is designed primarily for research it will contain enough improvements to make it the most flexible research pile in the world.

Emphasizing the peacetime aspects of Brookhaven, Dr. Borst said he doubted that any plutonium, the basic nuclear fuel for the atomic bomb, would ever be extracted from the pile. "This is not a military laboratory," he said. "We are interested in research and not production."

Two Ohio Firms To Vote on Proposed Merger Oct. 1

Stockholders of Lima Locomotive Works Inc., Lima, O., and General Machinery Corp., Hamilton, O., will be asked at special meetings Oct. 1 to approve a plan to merge the two companies.

The new company to be formed will be named Lima-Hamilton Corp. If the merger is approved, it is contemplated that immediate steps will be taken to manufacture diesel locomotives. Lima Locomotive has not been in the diesel engine field, but with the merger of the two firms, General Machinery's long experience with diesel power will be drawn on.

It is understood that Samuel G. Allen, chairman of General Machinery, will be named chairman of the executive committee. John E. Dixon, president of Lima, will remain in that position in the new company.

General Machinery manufactures presses for the automotive industry, railroad and industrial machine tools, can-making machinery and sugar mills. For the past three or four years General Machinery has been working on a new development in locomotive and stationary steam power. This is described as a free-piston gas generator, and it is expected that forming the new company will speed its commercial development.

Lima Locomotive is a producer of steam locomotives, power shovels, cranes, draglines and related equipment.

J. & L. Spikes Rumors of New Steel Mill in Cleveland

A new steel mill in Cleveland "is not even under consideration at this time" by Jones & Laughlin Steel Corp., a spokesman said recently in Pittsburgh.

The rumor concerning Cleveland construction plans arose in connection with the corporation's move to seek new financing for a general modernization program. An official said that if present prospects materialize, the corporation's Otis works in Cleveland would benefit, but that no complete new mill would be built.

New financing will not involve a public offering, according to First Boston Corp., investment banking firm which is acting for the corporation. According to present plans, Jones & Laughlin will place privately a large issue within 30 days.

Western Metal Using Industries Still Expanding

Report on Los Angeles area's growth shows additions in 1946 approached war peak. Steelmaking projects planned

LOS ANGELES

METAL fabricating and manufacturing industries in Los Angeles county, which received powerful impetus in growth during the war, have held their own in rate of increase since the war ended.

This was the salient fact of a report presented recently by E. D. Arthur, domestic trade commissioner for the Los Angeles Chamber of Commerce, before a meeting of the Institute of Metals, and Iron and Steel Divisions of the American Institute of Mining & Metallurgical Engineers, southern California section.

According to the report, in 1946 in the Los Angeles area new industries and expansions of existing plants totaled \$156 million, which closely approached the record figure of \$162 million in the war year of 1942.

Figures quoted from the National Industrial Conference Board show that Los Angeles county leads all major American industrial centers in diversity of production, with eight dominant industries. These are aircraft, motion pictures, automobile assembly, petroleum refining, furniture, oil well equipment and tools, food products and sportswear. On this list the area ranks first nationally in aircraft production, motion pictures, oil well equipment and tools, and sportswear output.

Old, New Facilities Listed

In a summation of current iron and steel facilities, the report states that Bethlehem Pacific Coast Steel Corp. operates three 50-ton open-hearth furnaces and finishing equipment to roll merchant bars, light structural, reinforcing bars and hot rolled rods for the making of wire, bolts and rivets.

In an expansion program now under way, to cost \$10 million, the company will add a 50-ton electric furnace, largest on the West Coast; a blooming mill, and a 21-stand bar and rod mill.

With the completion of new installations early in 1948, Bethlehem will have a total ingot capacity of 16,000 net tons per month and total steel capacity of 175,000 tons per year in southern California.

At the Columbia Steel Co. plant at Torrance, Calif., near Los Angeles, equipment consists of four 50-ton open-hearth



TAKING SHAPE: Through the aid of movable steel forms, the 4400-foot concrete Dry Coulee Siphon No. 1 is being poured around steel reinforcing hoops, some of which are visible in the left background. The inside form is shown still in place, while the outside form has been moved ahead for another pour. The siphon, 25 ft in diameter and 2 ft thick, will form part of the 88-mile West Canal in the U. S. Bureau of Reclamation's million-acre Columbia Basin irrigation project of eastern Washington. NEA photo

furnaces, one electric furnace and finishing mills to roll hot rolled bars and sheets, structural shapes and galvanized flat and corrugated sheets.

Kaiser Co.'s blast furnace at Fontana has a rated capacity of 1200 tons a day. Peak production has been maintained since the initial blowing in on Jan. 1, 1943. Kaiser's coke plant consists of 90 Koppers ovens. Coal comes from Sunnyside, Utah. The open-hearth division at Fontana consists of six 185-ton furnaces with a monthly capacity of 60,000 tons. To date, some 2 million tons of steel ingots have been produced.

Other Kaiser facilities include a plate mill with an annual rated capacity of 300,000 tons, a structural mill rated at 210,000 tons and a merchant mill rated at 180,000 tons.

Kaiser is constructing a Fretz-Moon pipe mill which will produce 125,000 tons annually of $\frac{1}{2}$ -in. to 4-in. diameter continuous butt-weld pipe; a cold rolling mill for light strip, capacity 42,000 tons annually; and cold drawing facilities to produce 24,000 tons per year of finished steel in rounds, flats, squares and hexes in $\frac{1}{4}$ -in. to 4-in. sizes.

Among the great steel consumers the report mentions Consolidated Steel Corp., with the largest structural and machine shop west of Chicago, featuring the largest machine tools in the West.

Western Pipe & Steel, Consolidated

subsidiary, makes all types of tanks, pressure vessels, rotary kilns, etc., as well as pipe in all diameters from water well casings to penstocks.

The seven large steel foundries in Los Angeles county have a combined capacity of about 3000 tons of castings a month. Largest use for steel castings is in the oil tool industry, with tractor and automotive equipment high on the list.

On nonferrous metal activities in the area, the report points out that western headquarters of Aluminum Co. of America are now in Los Angeles. Aluminum pig is shipped from the company's Vancouver reduction plant. Harvey Machine Co. operates an extrusion plant at Torrance. In addition, some 68 firms are engaged in the making of sand or permanent mold castings while nine major companies and several smaller plants produce aluminum die castings.

Among the 611 larger metalworking concerns in the county which use steel there are 36 groups whose products range from agricultural implements through the alphabet to wire products. Size and products of those organizations is shown in the table on the right.

Harshaw Chemical Co. operates a reduction plant at El Segundo for the production of antimony metal and oxides.

Los Angeles Tube Division of Phelps-Dodge Corp. is the largest local consumer of copper, manufacturing among other

tems both red and yellow seamless brass tubing and copper tubing from $\frac{1}{4}$ -in. to 3 in., forging rods and condensing tubes for the petroleum and utility industries. This plant has a capacity of 3 million pounds per month. Other copper fabricators include Anaconda Wire & Cable Co., Orange, Calif., Essex Wire & Cable Co., Anaheim, and General Cable Corp., Los Angeles.

Morris P. Kirk & Son Inc. operates a recently completed lead fabricating plant in Los Angeles, where sheet and pipe are made. Zinc slab, base alloys and sulphate are produced by Pacific Smelting Co., Torrance. In addition there are many major smelters of nonferrous scrap metals.

Survey Shows Coast Scrap Tonnage of 350,000 Tons

Western steel producers have just completed a survey of surplus war materials in the San Francisco area which shows that more than 350,000 tons of usable steel and iron scrap are available in seven northern California depots, most of which could be scrapped and released to steel mills and foundries immediately.

However, government red tape and lack of a businesslike program is preventing release of the scrap.

The report was submitted to the Steel, Foundry & Scrap Industries' Committee by a San Francisco subcommittee of representatives of steel and foundry companies in this area.

French Favor Meeting Europe's Steel Needs from Local Mills

Talk of reorganization of German steel industry meets with argument that France could produce 10 million tons of steel annually if coke were available from Germany. Labor peace formula rejected by government

PARIS, FRANCE

GERMANY'S proposed industrial reorganization is the topic of much discussion in France. Opinion here generally is that France should logically be Europe's main source of steel, and in support of this opinion it is pointed out that it has been more than 16 months since Germany's steel production ceiling was fixed at 5,800,000 tons a year, and output is still only about 3 million tons with expectations that another three years will be required before the maximum fixed by the Allies can be reached.

On the other hand, if France can be supplied with coke from the Ruhr the present French steel output of 6 million tons annually can be raised immediately to 10 million tons. And if the French steel industry is provided with the means for modernizing its equipment, output can be raised to 15 million tons. Furthermore, development of the French industry is seen to be more practical because one ton of coke shipped from Germany to Lorraine will have the same

overall effect on Europe's steel production as shipment of three tons of French iron ore to German furnaces.

Although French coal production in June was affected by the railroad workers' and coal miners' strikes, imports of coal in that month exceeded forecasts by about 10 per cent due to American deliveries which were 40 per cent more than quantities allocated for the month. Deliveries from Germany, however, fell short and imports from Poland appeared to be holding steady at about one-fifth of promised deliveries.

Automobile production in June showed an improvement but was still adversely affected by the Citroen strike which lasted six weeks and the earlier strike in the Renault plant, output for that month having been 10,505 cars, trucks and other vehicles, compared with 10,198 in May, 13,292 in April, and 8252 in June, 1946.

An agreement between the employers' federations and the labor unions was reached early this month after two weeks of negotiations, aimed at ending the wave of strikes which started two months ago and which at one time threatened to paralyze the country's economic life. This joint agreement, however, was disapproved by the government, which said the agreement's terms would lead to a general rise of industrial prices. Premier Ramadier is expected to see delegates of the unions and the employers' groups and ask them to reconsider their proposals.

The principal points of the agreement provided for an 11 per cent increase in the minimum hourly wage for Parisian workers to 35 cents, and for the revision and fixing by the end of September of prices of industrial goods affecting the cost of living for workers and farmers. The employers and labor unions also agreed on the principle of a minimum monthly wage of about \$66, instead of the \$58 per month wage which had been claimed as a "subsistence minimum" earlier this year.

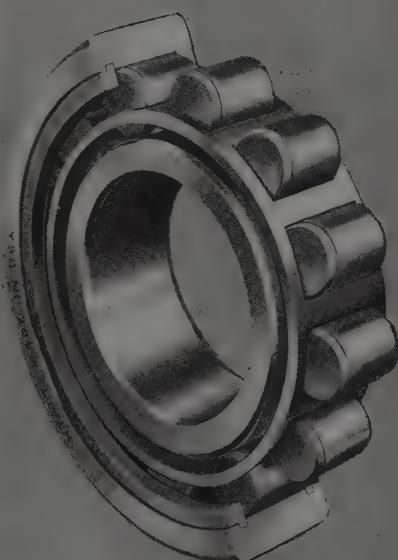
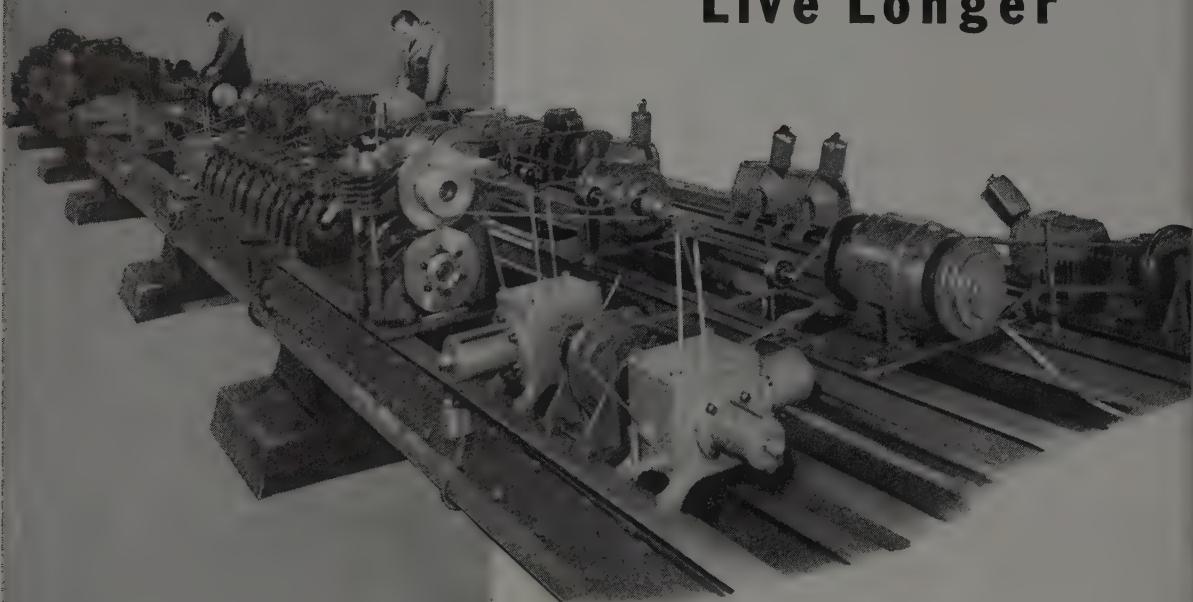
The two parties agreed that price control should be continued only on those goods considered essential to the productivity of workers and farmers, and that prices of all other industrial goods should be freed, as would be controlled goods when their supply came into balance with demand.

Size of Metal Using Firms in Los Angeles County

Product	Employees Per Establishment						Total Firms
	25-50	50-100	101-250	251-500	501 & More		
Agri. implements	8		4	2			14
Air cond. equip.	6	6	5	2			19
Cans, tin				1	1		2
Car const. & repair			1		1		2
Doors, sash, shutters	3		2				5
Elec. appar. mach., etc.	16	21	12	5	6		60
Elevators & equip.	2						2
Engines		5	2				7
Fire extinguishers		2					2
Fireplace equip.	2	1	1				4
Hardware	5	6	4				15
Heating equip.	23						23
Irrigation equip.	5						5
Kitchen equip.	4	14	2	2	3		25
Machinery misc., other metal prod.	22	43	12	1	3		81
Machine shop products	71	18	8				97
Meters		2		1			3
Mining machinery			4				4
Motor vehicle bodies, parts	7		2				9
Oil well, refinery equip.	16	14	6	6	6		48
Pipe, steel	7	3	2				12
Pumps	2	9	2	3	2		19
Railroad equip.			1				1
Refrigerators, cabinets & equip.	2	7	1	2			12
Sheet metal products	8	7	4				19
Springs		7	2	1	1		11
Stampings	8	9					17
Stoves, water heaters, furnaces, etc.		12	5	3	2		22
Structural & ornamental iron, steel work	6	8	9	2	1		26
Tanks		1	2	1			4
Tools, machine & hand		10	2		2		14
Trailers, tractor			1		1		2
Trailers, house	5	2	1				8
Trucks, indoor		4	3				7
Tubing, steel			1				1
Wire work	3	4	1	1			9

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HYATT ROLLER BEARINGS

Gossip around Detroit is that Ford, who remains as about only auto maker who has not boosted prices, may try to swing a publicity coup by holding prices at present levels or even reduce them a bit. However, cost accounting may dictate increases

DETROIT

CHRYSLER CORP. jumped on the price increase bandwagon (up \$75 to \$123 per car) as hinted here last week, leaving Ford as about the only manufacturer yet to boost car prices as the result of increases in labor and materials costs. How long the River Rouge manufacturer can hold out is conjectural, but there was talk around Detroit that Ford might even try to swing a publicity coup and hold prices at their present level, or even reduce them a trifle, to reverse the trend of the rest of the industry.

Probably no one would rather see this effectuated than the top echelons at Dearborn, but it must be remembered that cost control at Ford these days is a subject which is receiving close attention, which was not usually the case in the past. Under the careful scrutiny of L. D. Crusoe, there has been set up the most meticulous system of accounting, giving day-to-day reports on just how every department in the plant stands from a cost and production standpoint. Hence it is not likely that any bold steps such as have been taken in the past by the late Henry Ford, who could never be bothered too much by deductions of statisticians, will be forthcoming under the new regime. Rather it may be that a general increase in prices will shortly be announced, perhaps even before this is read.

Labor Chiefs Protest

As was to be expected, increases in automobile prices drew a terrible howl from spokesmen of the UAW-CIO. Since Walter Reuther, president of the organization, has been busy issuing news releases indicting the steel industry for its failure to expand itself to pieces (he urges a senate committee to "inaugurate a selective allocation of steel productive facilities to assure long runs and minimum downtime and the full use of all pig iron, steelmaking and steel rolling capacity"), it remained for his not-too-friendly sidekick, R. J. Thomas, to let loose a blast against the automobile industry for its price action.

Using the old dodge of profits before taxes, he claims General Motors, Chrysler, Hudson, Mack, Nash and Studebaker in the first six months of the year turned in a profit of \$374 million while operating at only 60 per cent of capacity. By

some more legerdemain he calculates this means a profit for car and truck producers of \$222 on the wholesale price of each unit built, adding that in prewar days a profit of \$50 per unit was considered good. Thomas concludes it is "pure and simple profiteering," and in-

to have the building completed by January and to start operations by late spring. According to present indications, fenders and bumpers will be two principal products, with output slated for both service and production requirements. Shears, presses, roll forming machines, welding equipment and possibly plating equipment would appear to be on the bill for machinery to equip the new plant. The fact that production will be for both replacement and production is of interest, since it was the first thought the facility would be purely for service demands.

Equipment also is on order for a die shop for the Cleveland plant, indicating that tooling requirements will be taken care of, in part at least, on the site. Another new die shop is being planned for the Chrysler Highland Park plant. At least that is the conclusion of machine tool interests who have been contacted on the job. They report that deliveries of machines are being deferred until completion of the building to house them. One source reports that the project, if not a die shop, is at least an "oversize toolroom." Chrysler also has ordered some plastic molding machinery, in connection with the same project, although company sources, in response to direct inquiry, state it is only a small experimental layout.

To See Machine Show

It is a foregone conclusion nearly every master mechanic and his staff in the automotive industry will spend several days at the machine tool show in Chicago, and there will doubtless be many officials there as well. It is understood Henry Ford II and several of his immediate lieutenants plan to inspect the equipment display.

Dealer Contracts Canceled

Machinery circles here report the WAA is canceling all dealer contracts as of Aug. 31. Since the start of disposal of surplus machinery, literally thousands of "dealers" have entered the field and have taken their cut of 12½ per cent on sales. Now it is apparently the plan to suspend all dealer activity, whether the agency be an old established firm or one of the newcomers. This will not affect manufacturers of equipment who purchase their own machines and recondition them for resale.

Ford Begins Suggestion Plan

Employee suggestion plan, perfected after over a year of study, involving detailed examination of over 100 plans

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	441,793	140,738
April	449,388	248,108
May	390,629	247,620
June	418,919	216,637
July	397,926*	331,100
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908
12 ms.	3,268,456	

* Preliminary.

Estimates for week ended:

Aug. 2	97,712	79,385
Aug. 9	79,452	77,825
Aug. 16	84,058	86,990
Aug. 23	80,000	89,360

vokes the attention of Attorney General Tom Clark, who, according to recent news reports, has decided at least to make it appear he is doing what the unions are demanding. Specifically, Thomas deposes, "Let him find an explanation for retail auto prices now more than 65 per cent above prewar levels." Perhaps the simple observation that automobile industry wages are about the same degree above prewar would answer this imperative.

Revive Cleveland Plant Plans

The reconstituted Chevrolet-Cleveland plant, now a parts manufacturing division instead of the original light-car project, is buying a considerable volume of machine tool and press equipment for delivery next spring. It is the plan



PLAN NEW AUTO: Production of a Caproni car as a low-price sideline to the Tucker '48 is being considered by Count Gianini O. Caproni, left, Italian industrialist and automobile manufacturer, and Preston Tucker, maker of the new rear-engined Tucker '48, which was placed on display recently at the Museum of Science and Industry in New York. Production of the Caproni car would be apart from the manufacture of the Tucker.

NEA photo

in force throughout the country, has finally been put into effect at the Lincoln plant of Ford Motor Co. and on a test basis in the steel mill of the Rouge plant. As described by the company, all workers excepting supervisory employees and others whose regular duties are of a creative nature are eligible to participate. Engineers, work standards men, cost men, mechanical designers, foremen and those engaged on experimental work are among the excluded personnel.

When awards are made for suggestions resulting in a direct calculable savings in material and labor costs, the money will be in an amount equal to the estimated savings during the first two months after the idea is placed in effect. Other suggestions will be awarded in an amount considered commensurate with the benefits to be derived from use of the idea, and may range from \$5 to a maximum of \$1500. Awards will not be paid for suggestions concerning ordinary routine procedure, ideas regarding purchasing of parts and materials or suggestions having to do with operations which are in developmental stages, such as projects where methods and tooling have not been completed and plans are still in a formative stage.

Boxes are placed around the plant and special forms provided on which suggestions may be written. Once a suggestion has been received, it is dated, numbered, screened for eligibility, copied for analysis, recorded and acknowledged

in writing. When the suggestion is eligible under the rules, an appointed investigator makes a thorough analysis and study of it. If the idea is complicated or involves considerable investigation, several weeks may be required to process it. Once the suggestion is adopted and placed in effect, the proponent is notified and presented with a check. Should the suggestion not be adopted, the author is given details in a letter and a personal visit from the investigator handling the matter.

Ford Uses New Rail Punch

Ford railroad workers who service the 135 miles of track in the Rouge plant are now using a "velocity power-rail punch" built by the Mine Safety Appliance Co., Pittsburgh, a 45-pound portable device resembling a smooth-bore rifle, carrying a punch propelled by a cartridge slightly larger than 0.45-caliber. The punch is capable of driving clean, round holes up to 1½ inches in diameter in ¾-inch steel. The equipment was used extensively by the Navy during the war damage control operations.

Training Program Resumed

Ford also has issued the first call for apprentices under a resumed training program sponsored jointly by the company and the UAW-CIO. It involves four-year courses consisting of 8000

hours of apprentice work on the job, plus 750 hours of supplementary instruction, half in classrooms at the plant and the remainder at home. Since before the war, the apprentice program has been confined to veterans, but is now open to all, with particular requirements now in the following categories—industrial machinists, toolmakers, die-makers, forge and hammersmiths, coremakers and molders in the jobbing foundry, and industrial electricians. Pay is at a fixed rate, starting a \$1.08 per hour for the first 500 hours and increasing to \$1.35-\$1.55 or \$1.50-\$1.70 per hour, depending upon the trade involved, after 8000 hours. Successful completion of the courses is productive of a journeyman's card in the trade.

Willys Boasts New Record

Willys-Overland boasts that it has produced more station wagons in the 12 months ended June 30—22,115—than any other single manufacturer turned out in a like period in the history of the industry, accounting for better than one-third of the entire station wagon output for the period. The former 12-month record was 19,265, in 1941. The industry-wide total for station wagons for the year ending in June was 59,725, or an increase of 25,844 over the 1941 total, the major portion of which was contributed by W-O. Generally speaking, station wagons are the highest priced units of any automobile models, yet they are meeting with steadily mounting popularity. The Willys job, an allsteel affair, is actually a simulated station wagon, but is much smoother riding than the jeep and accommodates a family of six comfortably.

Tells of Atomic Bomb Work

Chrysler Corp.'s role in the atomic bomb development is graphically portrayed in a recently published 67-page booklet by Wesley W. Stout under the title "Secret." It describes briefly the work Chrysler carried out in its X-100 Division, where the principal project was the manufacture of nickel-plated steel "barriers" for the gaseous diffusion plant at Oak Ridge, Tenn., where U-235 was separated from uranium by passing the hexafluoride gas of the element through porous barriers for thousands of times under vacuum. The largest nickel plating installation in the world was built at the Chrysler plant, now a gear and axle manufacturing unit, and Chrysler's success with the \$75 million contract proved a nickel-plated material was the equivalent of solid nickel, thereby obviating the need for practically all of the available nickel at the time. Carl E. Heussner, Chrysler plating specialist, was a prominent figure in the project.

Resistance Welding punches the right key



in typewriter manufacturing

Resistance welding slashes production costs in any industry where light-gauge metals are fastened. Recently, for example, a major typewriter manufacturer, seeking new methods of reducing fabrication costs, called Federal into consultation.

Federal engineers analyzed his product, his manufacturing methods, and suggested using a main typewriter body assembly composed of resistance welded steel stampings in place of expensive-to-machine castings. Federal designed and built a special projection welder, dies and fixtures for turning out over 200 completed assemblies per hour with a single operator. Production is up; costs,

rejects and operator fatigue are down.

Let Federal show you the cost-reducing methods possible in all types of metal fabrication with resistance welding. Arrange a consultation to find out how this applies to your production. No obligation, of course. Address inquiries to The Federal Machine and Welder Company, 487 Dana Street, Warren, Ohio.

Federal



FLASH WELDERS



ROLL SPOT WELDERS



PRESS TYPE WELDERS



GUN WELDERS



MULTI-POINT SPOT WELDERS



TRANSFORMERS

Barium Planning Expansions and Improvements

Holding company for 16 subsidiaries ranging from steel-works to fabricating plants will add new products

FURTHER expansion, improvement and correlation of its manufacturing facilities are planned by the Barium Steel Corp. and its subsidiaries. As part of this planning, a number of new products are being added to present lines.

A number of years ago, Chairman J. A. Sisto and President Rudolph Eberstadt, with both steel industry and investment banking backgrounds, conceived the idea of establishing a well-integrated organization which would have facilities ranging from primary steel plants to fabricating and assembly plants for finished products. In a period of three years they have come close to achieving that goal.

The Barium Steel Corp., which functions as the holding company for its 16 subsidiaries, bears little or no resemblance to its predecessor and namesake, Barium Stainless Steel Corp., formed in 1936 to produce stainless steel at Canton, O. During the war, Messrs. Sisto and Eberstadt converted the Canton plant to the production of large commercial and tool steel flat die forgings and changed its name to Barium Steel & Forge Inc., and it now is operated as a subsidiary.

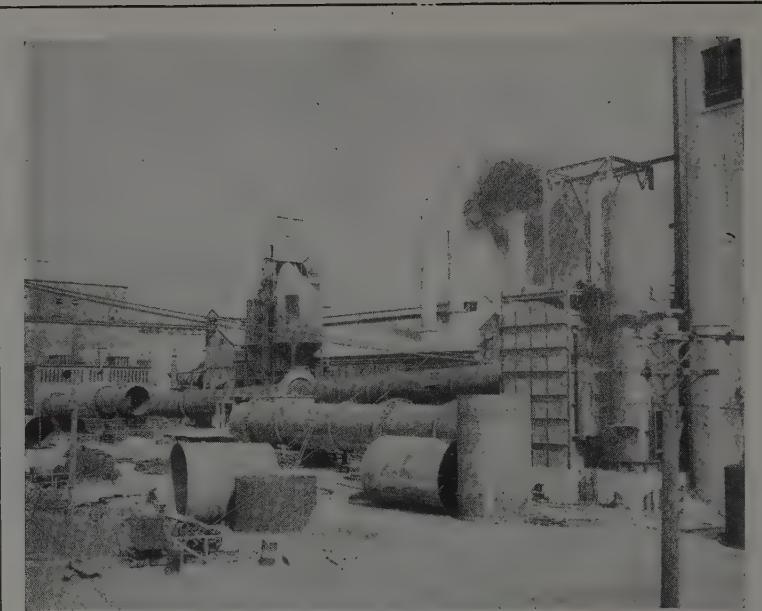
Subsidiary Builds Cranes

Clyde Iron Works, Duluth, purchased in August, 1944, directed all of its facilities during the war to production of whirley cranes, cargo hoists, anchor windlasses, derricks, hoists, etc. "Whirleys" made possible the new technique of assembling ships from prefabricated sections. Clyde now is building a number of these cranes for handling cargoes at French ports. New products now being made by Clyde include a lightweight road roller and a new-type crane built under an 8-year exclusive license.

Erie Bolt & Nut Co., Erie, Pa., acquired in June, 1945, makes special alloy bolts, nuts, studs and related items.

Globe Forge Inc., Syracuse, N. Y., produces drop and upset carbon and alloy steel forgings. It was taken over in December, 1945. Capacity is being expanded.

In February, 1946, arrangements were completed for the acquisition of Repub-



REFRACTORY KILN: One of the country's larger refractory kilns is under construction at the Maple Grove, O., plant of Basic Refractories Inc., Cleveland, to help meet unprecedented demand for materials essential for the repair and maintenance of the steel industry's furnaces. The massive circular steel sections in the foreground are parts of the 125-ft stack that will be 12 ft 6 in. in diameter. The long tubular structure in the center is the company's No. 10 kiln

lic Industries Inc., which in turn controlled the Kermath Mfg. Co., Detroit; Kermath Mfg. Co. of Canada Ltd., Toronto; Geometric Stamping Co., Cleveland; Porcelain Steel Corp., Cleveland; Perma-Jack Corp., Cleveland; and the Jacobs Aircraft Engine Co., Pottstown, Pa. The Jacobs company, because the highly technical and specialized nature of its business did not fit into the Barium pattern, was sold for \$1,500,000.

Central Iron & Steel Co., Harrisburg, Pa., producer of universal and sheared plates, was purchased in May, 1946. Ingots capacity is being increased from 28,000 to 36,000 net tons per month.

Detroit Steel Casting Co., Detroit, was purchased in June, 1946. Two new 6-ton electric furnaces have just been installed, replacing open hearths.

In August, 1946, Barium acquired the Wiley Equipment Co., Port Deposit, Md., and the Wiley Mfg. Co., Mountville, Pa., builders of steel barges, cranes and other hoisting and loading equipment. These two companies were merged and operations co-ordinated with the Clyde Iron Works.

Cuyahoga Spring Co., Cleveland, maker of coiled wire springs and wire forms, was taken over in November, 1946. Additional space already has been purchased to expand the capacity of this plant.

Bayonne Bolt Corp., Bayonne, N. J.,

was acquired in December, 1946. Its products supplement those of the Erie Bolt & Nut Co.

Most recent acquisition (July, 1947) was the George C. King Co., Sheffield, Ala., producer of gray iron castings. This subsidiary now is operated as the Sheffield Iron & Steel Co. and will provide castings for a new line of single and double cylinder inboard marine motors which will be introduced shortly by Kermath as part of packaged units for the boating trade.

Porcelain Steel shortly will introduce a new ice-cube making machine for the hotel, restaurant, hospital and related markets. No such machine now is being made. Porcelain Steel now makes permanent, adjustable jacks sold through the Perma-Jack Corp.

A new subsidiary formed this year, the American Steel Tractor Corp., has just completed production in the Canton plant of the prototypes for a new all-steel diesel-powered tractor for sale initially abroad and subsequently in the United States.

Managements of the various subsidiaries, according to Mr. Sisto, are given considerable leeway in conducting their affairs. Materials and supplies are purchased through local channels except where overall company policy is involved.

B R I E F S

Paragraph mentions of developments of interest and significance within the metalworking industry

Formica Insulation Co., Cincinnati, maker of laminated materials, has developed a new type laminated pulley for aircraft uses.

—o—

Langley y Cia., Buenos Aires, Argentina, announces that Jose Ovidio Martinez, an engineer with the firm, is on three months' business trip in this country to visit the plants of Cleveland Twist Drill Co., Fisher Governor Co., Ohio Injector Co. and other American manufacturers represented by Langley in Argentina and Uruguay.

—o—

Glidden Co., Cleveland, has completed new plant in Chicago for commercial recovery of soya sterols, wax-like alcohols used in making fine chemicals. Glidden expects to use part of the output of soya sterols and the balance will be offered for sale.

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Ohio Injector Co., Wadsworth, O., recently honored 12 employees with service ranging from 25 to 52 years. The company now has more than 120 employees with 20 or more years' seniority.

—o—

Anchor Fence Post Division, of Anchor Post Products Inc., Baltimore, manufacturer of fences, gates, enclosures, has appointed Berlang Trading Co. Inc., New York, its export representative in China.

—o—

Brown Fence & Wire Co., Cleveland, has sold a facility at Adrian, Mich., to Gerity-Michigan Die Casting Co. The plant consists of seven buildings with a total area of 80,000 sq ft.

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International Business Machines Corp., New York, has increased and extended benefits afforded its employees. Liberalized provisions include extension of payments to orphans of employees who died in service during World War II, an increased monthly retirement income and extension of benefits to disabled employees.

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Westinghouse Electric Corp., Pittsburgh, has 90 per cent completed an appliance manufacturing plant at Mansfield, O. When in full production, output of two refrigerators a minute is anticipated.

—o—

Goodyear Tire & Rubber Co., Akron, has purchased for \$2,200,000 an aircraft manufacturing plant in Akron which it operated during the war. Goodyear will use the plant, comprising 18 buildings

located on 36 acres of land, to expand its production of transparent film and foamed latex.

—o—

F. W. Courtney & Associates, Los Angeles, has purchased for \$350,000 a perchlorate plant in Los Angeles which was operated for the government during the war by Western Electrochemical Co. Built at a cost of \$1,629,773, the facility consists of seven main buildings on 3.3 acres of land. The plant will be used for the manufacture of industrial chemicals and electrolytic metals.

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Ajax Alloy Foundry Inc., Baltimore, recently formed, has started production at its foundry at 32 S. Franklinton Rd. of nonferrous castings up to 50 or 60 pounds.

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Jones & Laughlin Steel Corp., Pittsburgh, has moved its Washington office to the Commonwealth Bldg., 1625 K St. F. A. Chidsey continues as district sales manager.

—o—

National Supply Co., Pittsburgh, manufacturer of oil, gas and water well supplies, has formed an educational department with Dr. B. E. Warden, former dean of students and director of student personnel at Carnegie Institute of Technology, as director. National Supply is inaugurating a personnel training program for all its manufacturing plants, sales and engineering departments and company stores.

—o—

National Bureau of Standards, Washington, plans to establish a new unit, Institute of Numerical Analysis, at the University of California at Los Angeles. A high-speed electronic computing machine, now under development, will be installed at the institute when completed.

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Independent Oxygen Manufacturers' Association, Cleveland, has appointed a committee to handle a merchandising program, one aim of which is to bring to the attention of association members new products that come into the welding industry. Committee chairman is Joseph Wagner, 3300 Lakeside Ave., Cleveland.

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Bureau of Mines, Washington, has released its "Annual Report of Research and Technologic Work on Coal, Fiscal Year 1946" which reviews the work of Bureau engineers and scientists in coal mining and exploration, coal sampling and analysis, gas-and-dust explosion re-

search, coal preparation and storage, coking and gasification studies and the production of synthetic liquid fuels.

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Owens-Corning Fiberglas Corp., Toledo, Ohio, has produced "Watts in Glass," a full-color, sound motion picture portraying the role of Fiberglas insulation in electrical equipment. The film has a running time of 25 minutes and is available for showing.

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Brown Instrument Co., Philadelphia, subsidiary of Minneapolis-Honeywell Regulator Co., announces that on Sept. 15 the first 1947-48 term opens in its school of instrumentation at Philadelphia, now in its twelfth consecutive year.

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Electric Fittings Foundry Co., Birmingham, newly formed, has started production of aluminum bronze line suspension and strain clamps.

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Poole Foundry & Machine Co., Baltimore, has re-equipped its plant and as a result has increased its output of flexible shaft couplings, cut gears and reduction gears three-fold.

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War Assets Administration announces that about \$15 million worth of surplus telephone and telegraph equipment is being offered in two national sales at U. S. Army General Depot, Ogden, Utah, and WAA Warehouse, 24th and Chestnut Sts., Philadelphia.

—o—

Johnson Bronze Co., New Castle, Pa., has opened sales offices at 1518 Guilford Ave., Baltimore, and 1044-46 Broadway, Denver.

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Hedwin Engineering Co., Baltimore, which conducts an experimental laboratory in sheet film plastics, has changed its corporate name to Hedwin Corp.

—o—

U. S. Drill Head Co., Cincinnati, manufacturer of multiple spindle drill heads and fixed center spindle heads, has sold its associate firm, U. S. Machine Tool Co., to N. Ransohoff Co., Cincinnati. Specializing in the manufacture of anti-friction bearings and hand feed milling machines, U. S. Machine was sold with its entire inventory and fixtures.

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Bingham Stamping Co., Toledo, O., has moved the tool department of its Herbrand Division to a recently completed building.

—o—

Birtman Electric Co., Chicago, manufacturer of household washers and vacuum cleaners, has bought a building adjoining its Fullerton Ave. plant for \$164,000. The facility will be used for expansion of Birtman activities.

The Business Trend

Steadiness Displayed By Industrial Activity

STEADINESS characterized industrial activity in the week ended Aug. 16, and held STEEL's industrial production index at the preceding week's level of 158 per cent of the 1936-1939 average.

However, there were some minor fluctuations in various segments of industry in the week ended Aug. 16. Steel ingot production eased down to 94 per cent of capacity, marking the first change since it attained 95 per cent in the week ended July 26. Despite production difficulties arising out of work stoppages due to the heat wave and a strike at a body builder's plant the week's total output of passenger cars, trucks and busses rose to an estimated 84,058 units, compared with 79,452 in the preceding week.

ELECTRICITY—The prevailing high level of industrial activity and the seasonal lengthening of nights are being reflected in an upward trend in electric power distribution. Since the beginning of the second half of 1947, electricity output has risen successively each week, except one and the decline in that instance was negligible. The rise put the distribution in the week ended Aug. 16 to 4,923,000,000 kilowatthours, a level exceeded only by the all-time record of 4,940,453,000 in the week ended Dec. 21, 1946.

COAL—After declining steadily since the miners went back to work in July, bituminous coal production showed a slight improvement in the week ended Aug. 9 when es-

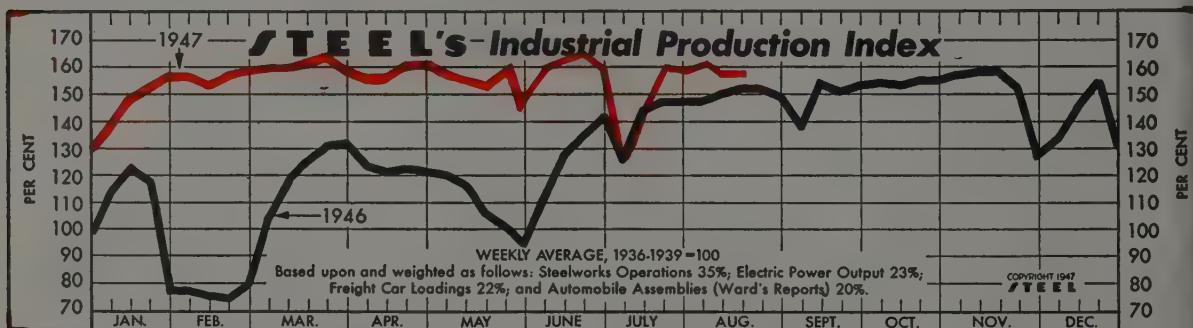
timated output was 11,750,000 net tons. However, productivity is still well below the 12½ to 13 million ton per week level prevailing in the first half of this year.

PRICES—Continuation of the price inflation spiral pushed the wholesale price index of the U. S. Bureau of Labor Statistics in the week ended Aug. 9 to a new postwar peak, 152.2 per cent of the 1926 average. This marks the fourth consecutive week a postwar peak has been set.

TRADE—The week ended Aug. 9 marked the first time since the week ended Apr. 19 that department store sales have declined in dollar volume below that of the corresponding week of 1946. In the week ended Aug. 9, dollar volume of sales were three per cent below that of the like week last year, the decline being attributed to hot weather that discouraged shopping. Considering that prices today are higher than they were a year ago, the decline in dollar volume does not accurately reflect the extent of the drop in physical volume of sales.

PRODUCTION—While actual physical volume of U. S. production in goods and services in the second quarter of 1947 was below wartime peaks, the dollar value, as a result of inflation, was at a new all-time rate of \$226 billion annually, the U. S. Commerce Department reported. Previous peak dollar value was the \$222 billion yearly rate in the first quarter of 1945.

BUSINESS FAILURES—Growing larger month by month, business failures in July totaled 299 concerns, compared with 283 in June, Dun & Bradstreet Inc. reported. However, in the corresponding month of 1938, failures numbered 1073.



The Index (see chart above): Latest Week (preliminary) 158 Previous Week 158 Month Ago 160 Year Ago 158

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	94.0	95.0	92.5	90
Electric Power Distributed (million kilowatt hours)	4,923	4,874	4,732	4,422
Bituminous Coal Production (daily av.—1000 tons)	1,958	1,925	1,039	2,052
Petroleum Production (daily av.—1000 bbl.)	5,159	5,104	5,050	4,843
Construction Volume (ENR—Unit \$1,000,000)	\$57.4	\$109.8	\$104.4	\$129.1
Automobile and Truck Output (Ward's—number units)	84,058	79,452	103,091	88,990

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

TRADE

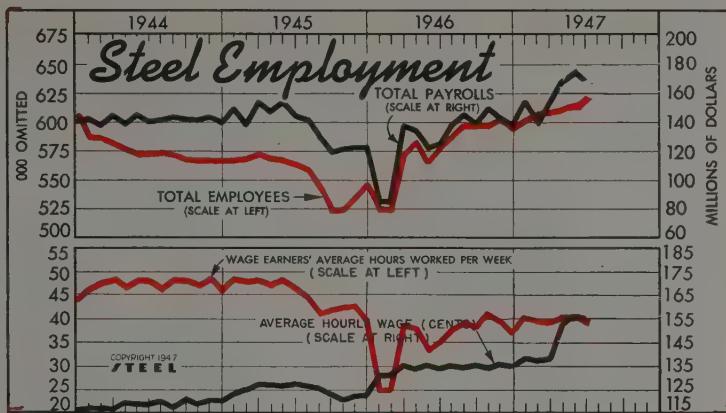
Freight Carloadings (unit—1000 cars)	907†	905	920	888
Business Failures (Dun & Bradstreet, number)	78	60	63	17
Money in Circulation (in millions of dollars)†	\$28,223	\$28,206	\$28,225	\$28,353
Department Store Sales (change from like wk. a yr. ago)†	-3%	+1%	+8%	+30%

† Preliminary. † Federal Reserve Board.

Steel Employment

	Employees†	Total Payrolls	Hourly Wage†
	(000)	(millions)	(cents)
1947	1946	1947	1946
n.	601	\$22	\$84.9
ob.	607	522	84.9
ar.	609	570	150.6
ay	615	582	168.3
ne	623	578	175.8
ly	585	578	167.6
ug.	596	596	145.2
pt.	596	596	139.6
ct.	596	600	150.6
ov.	594	594	143.4
ec.	594	594	137.2
			135.2

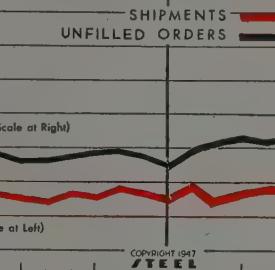
† Monthly average. * Figures for January and February, 1946, are merely averages derived from a report that combined those two strike-affected months.



Steel Castings

DATA COMPILED BY BUREAU OF CENSUS,

DEPARTMENT OF COMMERCE



Commercial Steel Castings

(Net tons in thousands)

	Shipments	Unfilled Orders	1947	1946	1947	1946
Jan.	189.0	102.5	365.5	359.5		
Feb.	125.6	60.6	421.4	387.2		
Mar.	184.9	104.5	484.9	406.4		
Apr.	144.2	146.6	427.6	384.7		
May	140.9	130.8	443.2	374.2		
June	189.0	121.5	445.5	354.4		
July	117.5	—	356.8	—		
Aug.	129.7	—	373.7	—		
Sept.	126.5	—	380.6	—		
Oct.	137.3	—	384.1	—		
Nov.	130.6	—	372.1	—		
Dec.	123.9	—	362.8	—		

* Castings for sale.

Foreign Trade

Bureau of Foreign and Domestic Commerce
(Unit Value-\$1,000,000)

	Exports	Imports	
1947	1946	1945	
n.	1,114	799	903
ob.	1,151	670	887
ar.	1,327	815	1,030
pr.	1,299	757	1,005
ay	1,428	851	1,185
ne	1,242	878	870
ly	826	893	—
ug.	883	737	426
pt.	643	514	378
ct.	537	455	394
ov.	987	639	481
ec.	1,097	786	536
Total	9,743	9,804	4,935
			4,136



NANCE

Bank Clearings (Dun & Bradstreet—millions)

Federal Gross Debt (billions)

Bond Volume, NYSE (millions)

Stocks Sales, NYSE (thousands)

Loans and Investments (billions)†

United States Gov't. Obligations Held (millions)†

† Member banks, Federal Reserve System.

Latest Period*	Prior Week	Month Ago	Year Ago
\$11,367	\$12,029	\$12,542	\$11,100
\$259.8	\$259.4	\$258.5	\$257.7
\$14.2	\$14.6	\$26.7	\$17.4
3,662	3,592	5,939	3,747
\$63.6	\$63.5	\$63.2	\$59.8
\$38,735	\$38,739	\$39,099	\$41,454

RICES

STEEL's composite finished steel price average	\$75.41	\$75.41	\$69.82	\$64.45
All Commodities†	152.2	151.3	148.3	127.1
Industrial Raw Materials†	166.4	165.6	162.0	145.7
Manufactured Products†	147.2	146.0	143.7	121.3

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry



F. G. HOYT

W. V. Merrihue has been appointed manager of community and employee relations for the apparatus department, General Electric Co., Schenectady, N. Y. He joined General Electric in 1925, serving in various capacities in advertising and publicity until 1944, when he became manager of the newly-formed Advertising & Sales Promotion Divisions, apparatus department, the post which he held previous to his latest appointment. He is succeeded in that position by **J. S. Smith**, formerly manager of the Visual Education Division, Advertising & Sales Promotion Divisions.

—o—

To co-ordinate the new program of modernization and expansion of production facilities in the Woven Wire Fabrics Division, John A. Roebling's Sons Co., Trenton, N. J., the company has announced the appointment of **F. G. Hoyt** as general manager. He will be assisted in his new post by **J. Fennell Berger**, assistant manager of sales, and **F. Clifford Peet**, superintendent of production.

—o—

Irving J. Fletcher has been promoted to the position of chief engineer of the product & development engineering section of the American Hardware Corp., New Britain, Conn. Formerly factory manager of Corbin Cabinet Lock Division of the corporation, he is succeeded in that position by **Frank L. Mathes Jr.**, who had been assistant factory manager of that division.

—o—

Walter E. Jubien, recently of the French Supply Council, Washington, has become associated with the Barium Steel Corp., New York. He will assist in the further development of the export sales of products of subsidiaries of the corporation, and will immediately visit France and other European countries, where he will assist in broadening rela-



DR. B. E. WARDEN

tionships of the Barium Steel Corp. and its subsidiaries with governmental agencies and commercial organizations.

—o—

The National Supply Co., Pittsburgh, is inaugurating a personnel training program for all its manufacturing plants, sales and engineering departments, and company stores, and has appointed **Dr. B. E. Warden**, former dean of students and director of student personnel at Carnegie Institute of Technology, as the company's first educational director, with headquarters in Pittsburgh.

—o—

Roger G. DeLong, formerly acting manager and sales manager of the Rockford Division, Twin Disc Clutch Co., Racine, Wis., has been appointed manager of the Hydraulic Division of the company, located in Rockford, Ill. **W. B. Gibson**, who has been assistant district manager of the eastern territory, has been appointed sales manager of the Hydraulic Division.

—o—

E. W. Deck, recently general manager, Trent Tube Mfg. Co., Chicago, has been retained by Borg-Warner Corp., Chicago, as a consultant on manufacturing research. Before the war, Mr. Deck was engaged in research and development on steel production and fabrication processes for the Union Carbide & Carbon Corp., New York.

—o—

Intercontinental Engineers Inc., Chicago, announces appointment of **T. W. Allsworth** as vice president in charge of engineering and construction. His early experience included the organization and operation of the Universal Machine & Equipment Co., a corporation manufacturing gasoline powered shovels. He later served with the Aluminum Co. of America, Pittsburgh, the American Rolling Mill Co., Middletown, O., and the



FRANK M. HIGGINS

Bridgeport Brass Co., Bridgeport, Conn., where he had charge of the design and construction of the Bridgeport Brass Indianapolis Rolling Mill, which he managed throughout the war. In 1946 Mr. Allsworth became associated with Intercontinental engineers as chief project engineer in charge of the design and construction of a plant for Owens-Illinois Glass Co., Toledo, O.

—o—

Frank M. Higgins has been appointed manager of the Atlanta branch office of Reeves Pulley Co., Columbus, Ind. He has been directly associated with the design and installation of Reeves variable speed equipment for the past 14 years, spending a number of years as assistant to the chief engineer of the company, and the last three years as a sales engineer working out of the company's home office.

—o—

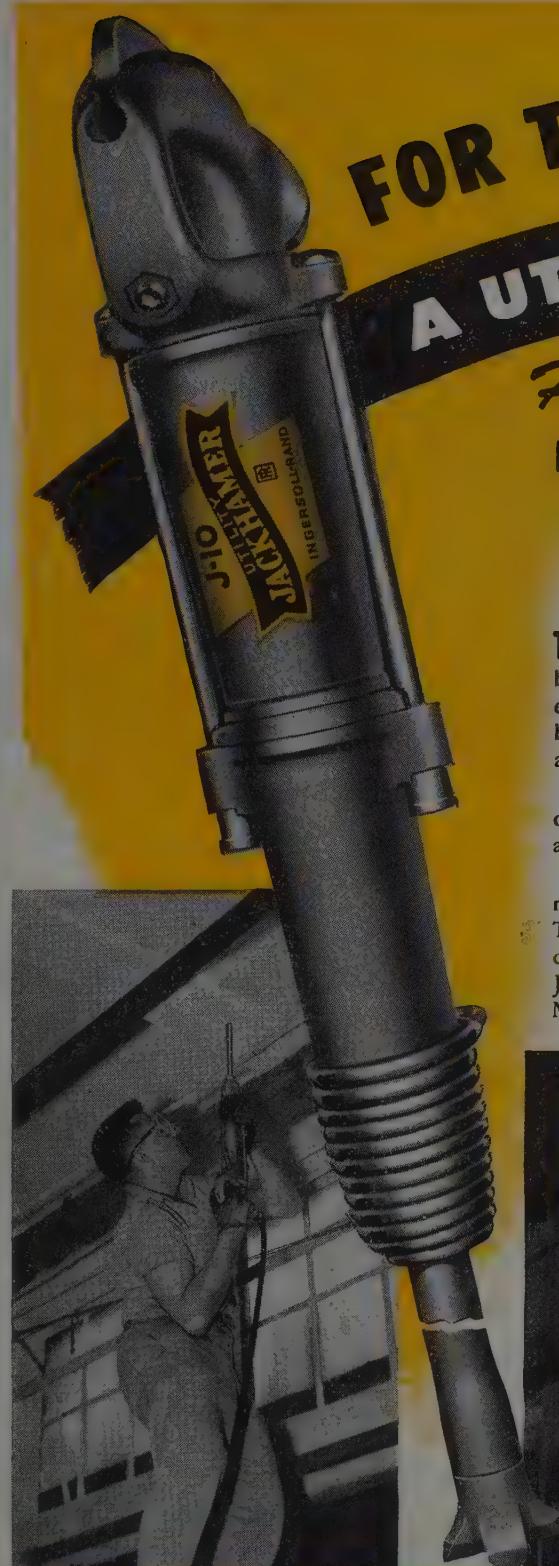
J. C. Witherspoon has been appointed division superintendent of open hearths at the Steel & Wire Works, Donora, Pa., of American Steel & Wire Co., subsidiary of U. S. Steel Corp. **J. M. Nelson** has been made chairman of the blast furnaces, the open hearth and the coke committees, and will be located at the company's headquarters, in Cleveland. He succeeds Mr. Witherspoon in that position.

—o—

Carl J. Dinie has been appointed manager of commercial research for Rheem Mfg. Co., San Francisco, with headquarters in the company's New York office.

—o—

W. A. Staublin has been appointed sales manager of hydraulic equipment for the Hydraulic Division of Sundstrand Machine Tool Co., Rockford, Ill. He has been associated with engineering and sales departments of the division since 1936. **C. W. Lang** has been appointed



FOR THE FIRST TIME!

A UTILITY Jackhamer

Having **UTILITY WEIGHT**
REAL DRILLING POWER
AUTOMATIC ROTATION
Air Operated

This amazingly *powerful* Jackhamer weighs only 14 lbs and can be used wherever *light weight* is of first importance. It handles easily on a scaffold or ladder and makes short work of holes for hangers, anchor bolts, foundation bolts, pipe, conduit, dowels, and reinforcing rod. It is ideal for plug and feather work.

The "J-10" tears out brick work for doorways and windows or cuts anchors for girders and joists. It is used for chiseling and channelling and for vibrating concrete forms.

At last, here is a real Rock Drill—*air operated*—built for plant maintenance work. It is no longer necessary to use make-shifts. The "J-10" UTILITY Jackhamer is fast, powerful, easy to handle, has strong rotation and hole blowing and uses standard Jackbits. Buy a J-10 UTILITY Jackhamer to save TIME AND MONEY.



The "J-10" UTILITY Jackhamer
is built by the world's largest
manufacturer of Rock Drills and Compressors

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

34-5

sales manager of the Oil Burner Pump Division of the company.

—o—
R. F. Going has been appointed associate administrator of War Assets Administration for Zone III. He will supervise the WAA war surplus disposal program in six regional offices, Chicago, Detroit, Cleveland, Cincinnati, Louisville, and Minneapolis.

—o—
Earl R. Nelson, formerly sales district representative in central and southern Ohio for Joseph T. Ryerson & Sons Inc., Chicago, has been named general manager of the company's plant at Cincinnati.

—o—
The Pangborn Corp., Hagerstown, Md., has announced the following district personnel changes in the Pittsburgh, Chicago and Pacific Coast districts: Ralph M. Trent, manager of Pittsburgh and central Pennsylvania district, has been transferred to the Pacific Coast as manager of all the Pangborn business on the West Coast, with headquarters in Los Angeles. John D. Wise, former director of purchases of the corporation, and district sales representative in the Chicago district, will succeed Mr. Trent as manager of the Pittsburgh district. Frank Newell has been transferred to the Chicago office as district sales engineer. He was formerly in sales engineering at the home office of the corporation.

—o—
Percy W. Noble has been appointed comptroller of ATF Inc., New York, parent company of American Type Founders Inc.

—o—
Albert Faber, formerly chief engineer of the Briggs Mfg. Co., Detroit, has been appointed director of plant operations at the Glauber Brass Mfg. Co., Kinsman, O.

—o—
Samuel H. Serre, marine construction and salvage engineer for the Merritt-Chapman & Scott Corp., New York, has been named Cleveland resident vice president.

—o—
The Monarch Machine Tool Co., Sidney, O., has announced election of two new directors, L. L. Warriner, president, Master Electric Co., Dayton, O., and F. Eberstadt of F. Eberstadt & Co., New York. They succeed the late Budley A. Hawley and the late Frank P. Thedieck, chairman of the board.

—o—
E. W. Sanders, sales manager of the rubber-to-metal products of Goodyear Tire & Rubber Co., Akron, will resign Sept. 1 to become vice president and sales manager of the Wilsolite Corp.,

Buffalo. He joined Goodyear in 1928, and organized the company's printer supplies department in 1936. E. R. Coate has been appointed acting manager of the printer supplies sales. In the two other departments headed by Mr. Sanders, Ernest Peterson will continue as manager of industrial roll sales, and R. W. Eckstein will continue as manager of tank lining sales.

—o—
Luria Bros. & Co. Inc., Philadelphia, announces appointment of Stanley M. Claster as assistant district manager, to work with J. L. Gordon, the southwestern district manager in charge of the St. Louis, Houston and Pueblo offices. The appointment of John L. Crum as assistant district manager, in charge of the Pueblo, Colo., office, and the Rocky mountain district, with headquarters in Pueblo, has also been announced by the scrap brokerage firm.

—o—
Jerold Van Alsburg has been appointed an Ohio sales representative by Rapids-Standard Co. Inc., Grand Rapids, Mich. He will maintain an office in Toledo, O. For 18 years Mr. Van Alsburg had been sales engineer with Hart & Cooley Mfg. Co., Holland, Mich.

—o—
William R. Holmes, United States Steel Supply Co., Chicago, has been appointed assistant district manager of this U. S. Steel Corp. subsidiary's warehouse in Newark, N. J. He has been associated with the company for nearly eight years. In 1942 he became associated with the company's Milwaukee sales office, and has been serving in an outside sales capacity until receiving his current promotion.

—o—
Gaylord W. Penney, manager of the Electro-Physics Division, Research Laboratories, Westinghouse Electric Corp., Pittsburgh, has been appointed George

Westinghouse professor of engineering at Carnegie Institute of Technology, to succeed Dr. Douglas F. Miner in the Westinghouse chair at the institute. Dr. Miner has been appointed director of student personnel and welfare at Carnegie Institute.

—o—
E. Wayne Haley has been appointed director of sales, Southern Alkali Corp., subsidiary of Pittsburgh Plate Glass Co., Pittsburgh. He has served as assistant director of sales for Southern Alkali during the past 12 years. In his new position he succeeds Eli Winkler, who will continue with the firm in the capacity of sales consultant. Mr. Haley will maintain headquarters in New York.

—o—
Charles A. Petri has been elected president of the Milwaukee Industrial Marketing Association. He is advertising manager of the Falk Corp., Milwaukee. Other officers elected by the association are: A. R. Toffe, Allis-Chalmers Mfg. Co., Milwaukee, vice president; Bruce Stablefeldt, Blackhawk Mfg. Co., Milwaukee, secretary; Joseph Dilot, A. O. Smith Corp., Milwaukee, local director; Tony Crossman, Cramer-Krasselt Co., Milwaukee, national director.

—o—
Raymond W. Haugh recently was appointed manager of industrial lime sales for the National Gypsum Co., Buffalo. His appointment was one of several managerial appointments announced by the company recently, and through mislabeling, Mr. Haugh's photograph, reproduced on page 80 of the Aug. 18 issue of STEEL, was incorrectly captioned as that of William U. Townsend, who has been appointed assistant manager of the Industrial Division of the company.

—o—
Norman C. MacDonald, vice president and general manager, Crosley Distributing Co., New York, has been appointed



WILLIAM R. HOLMES



RAYMOND W. HAUGH

For that
hot spot
you're
going to
ventilate...



Graybar's ventilation survey will tell you

Fresh air is available! The right equipment will move it efficiently and economically wherever you want it. In the Ilg line of blowers, fans, unit heaters, and accessories—all distributed by Graybar—there is everything you need for removing heat, fumes, dust, or stale air from a single room; for ventilating your entire plant; for built-in ventilation of your product; or for space heating or drying. The near-by Graybar Power Apparatus Specialist will make a survey of your plant to help you or your electrical contractor determine the best system for your purpose.

Our national warehousing system can simplify your job of getting "everything electrical." Although it's still impossible for us to maintain complete stocks today, many items are available for immediate delivery. Call our nearest office. *Graybar Electric Company. Executive offices: Graybar Building, New York 17, N. Y.*



IN OVER 90 PRINCIPAL CITIES



IT'S GOT TO BE GOOD
TO GO "VIA GRAYBAR"

No matter what you order from Graybar, you never need worry about its quality. Graybar does not—and will not—distribute any item unless it is made by a reputable manufacturer and has thoroughly proved its dependability in actual service.

Thus you always can be sure that, if you get it "via Graybar", it will do the job for which it is intended.

4742

general sales manager of Crosley Division of Avco Mfg. Corp., Cincinnati. He had been, for many years, eastern regional sales manager for Crosley. He is succeeded as general manager by **Bert Cole**. **Sydney D. Mahan**, former head of both sales and advertising, will head an expanded advertising, sales promotion, and public relations department for the corporation.

—o—

Charles W. Schooley has been appointed merchandising manager of the Cadillac Motor Car Division of General Motors Corp., Detroit. He has been with the division since 1928. Mr. Schooley succeeds **Charles H. Betts**, who has resigned to become Cadillac distributor in Des Moines, Iowa.

—o—

G. C. Bradshaw, associated with Malinkrodt Chemical Works, St. Louis, for more than 20 years, has been promoted to sales manager of the Western Division of the company.

—o—

J. B. Huntress, sales promotion manager, has been promoted to assistant director of advertising and sales promotion of Nash Motors Division, Nash-Kelvinator Corp., Detroit. **W. A. Keller**, formerly handling service promotion, has been named to succeed Mr. Huntress as sales promotion manager.

—o—

Wendell J. Farischon has been named news editor of the news service of Caterpillar Tractor Co., Peoria, Ill., succeeding **Jerry Reichart**, who has joined Cutter Laboratories, Berkeley, Calif., as editor of employee publications.

—o—

Rene Pepin has been named vice president in charge of sales and advertising by Radon Electronics Co., Milford, O.

—o—

Earl P. Kurpier, formerly chief foundry specialist, OPA, Chicago district, has joined the Sales Division of Beardsley & Piper Co., Chicago.

—o—

Howard F. Powders has been appointed special representative-aviation, in the general sales department of the American Steel & Wire Co., United States Steel subsidiary, New York. He has been in the Manufacturers Division of the department since April of this year.

—o—

R. R. Kerr has been appointed advertising manager of the Valve and Saginaw Divisions of the Eaton Mfg. Co., Cleveland. He will have headquarters in Detroit.

—o—

Cornelius Bolen, secretary and treasurer of Converse Bridge & Steel Co., Chattanooga, Tenn., has been elected president of the Chattanooga Control,

Controllers Institute of America. **Lawrence D. Luey**, comptroller of Connors Steel Co., Birmingham, has been re-elected president of that city's control, which also named **Marvin F. Pixton**, vice president and treasurer of Ingalls Iron Works Co., a director. **J. H. Barrett**, secretary-treasurer of Murray Corp. of America, Detroit, has been chosen president of the Detroit Control, and **V. D. Hanna**, Wolverine Tube Division of Calumet & Hecla Consolidated Copper Co., Detroit, has been named a director. The Pittsburgh Control elected **Paul E. Shroads**, National Steel Corp., Pittsburgh, president. The new treasurer of the Kansas City, Mo., Control is **R. G. Waring**, Butler Mfg. Co., Kansas City.

—o—

After Sept. 1 the lamp department of General Electric Co., Schenectady, N. Y., will discontinue its Nela Specialty Division, and **Charles F. Strebiger**, manager of the division, will be transferred to the department's headquarters in Nela Park, Cleveland. **H. R. Walker** will be transferred to the Atlantic sales district, and **W. W. Becky** to the midland sales district, Chicago.

—o—

A. M. Kuehmsted, chief engineer for the Santa Fe Tank & Tower Co. in Los Angeles for the past 12 years, has been assigned to the New York branch of the company. He will take over the district management of cooling towers, air cooled units, and wood tanks.

—o—

The Emerson Electric Mfg. Co., St. Louis, has announced the appointment of **Louis L. Schneider** as resident representative for the company in Syracuse, N. Y.

—o—

William C. Jones has been appointed auditor of Alabama By-Products Corp., Birmingham. He recently had been comptroller of Alabama Metal Lath Co., Birmingham.

—o—

Charles M. Hogan has been appointed resident patent counsel in charge of radio and electronic patents of the Crosley Division, Avco Mfg. Corp., Cincinnati. He succeeds **Robert L. Spencer**, who joins **Alden D. Redfield**, former Crosley counsel, now heading the patent department of the Avco Mfg. Corp. in Detroit.

—o—

Paul D. Davison has been appointed works manager of the new plant, near Plymouth, Mich., of Evans Products Co., Detroit. He will direct all production operations in the plant which manufactures the Evans auto-loader and utility-loader for railroad freight cars, bus and truck heating and ventilating equipment, passenger car heaters and oil burning

automatic water heaters, home heaters and furnaces. Mr. Davison formerly had been associated with the United Specialties Co., Chicago.

—o—

L. R. Garretson has retired as advertising manager of Leeds & Northrup Co., Philadelphia. He is succeeded by **Kenneth W. Connors**, a member of the Advertising Division since 1934.

—o—

Charles R. Wallander Jr. has become associated with Dulien Steel Products Inc., New York, seller of ferrous and nonferrous products, railroad equipment, and machinery. Mr. Wallander, who previously had been associated with the tin mill products branch of the industry, will be directly connected with the procurement department of the company's Warehouse Division, with warehouses in New York and Williamsport, Pa.

—o—

Alfred E. Siegel has been appointed advertising manager for all divisions of the Royal Metal Mfg. Co., Chicago.

—o—

Eldon E. Libby has been named merchandising manager of Southern States Iron Roofing Co., Savannah, Ga.

—o—

Harry W. Knoll has been elected president of H. B. Rouse & Co., Chicago, manufacturers of time-saving equipment for printing concerns, hand milling machines and fixtures for the metalworking fields.

—o—

W. S. Dawson has been elected vice president in charge of sales, U. S. Automatic Corp., Amherst, O. He formerly had been president and general manager of Romec Pump Co., Elyria, O.

—o—

L. R. McAfee has been appointed district manager in Dayton, O., for the Peninsular Steel Co., Detroit, succeeding **Lee Dallas**, who has resigned.

—o—

L. R. Constantine, formerly employed by the Dravo Corp., Pittsburgh, has been appointed welding engineer of Elliott Co., Jeannette, Pa.

—o—

Two appointments in the truck and bus tire sales department of B. F. Goodrich Co., Akron, are: **Howard F. Kidwell** will be in charge of fleet sales, including national account sales and state business; **Thomas I. Jenkins** will be in charge of industrial tire sales.

—o—

Wheeling Steel Corp., Wheeling, W. Va., has announced the moving of its San Francisco district office from 907 Rialto Bldg. to 218 Sharon Bldg., 55 Montgomery St. **K. P. House** will assume charge of this office, succeeding



E. B. CLEBORNE

Has been elected executive vice president, Allegheny Ludlum Steel Corp., Pittsburgh. Noted in STEEL, Aug. 18 issue, p. 84

C. S. Larsen, who has been appointed assistant manager of the New York sales office.

—o—

New assistant directors named to the staff of Battelle Memorial Institute, Co-

OBITUARIES

William H. Weimer, 55, president and general manager, Davis & Thompson Co., Milwaukee, was injured fatally in an automobile accident Aug. 16. Associated with this concern, which produces machine tools for the automotive industry, since its organization in 1928, Mr. Weimer became head of the company in 1943.

—o—

William W. Steary, vice president, Imperial Type Metal Co., in charge of the New York office, died Aug. 17, in Orange, N. J.

—o—

John A. Chesney, 75, retired employment agent and pension-plan administrator for the General Electric Co., Schenectady, N. Y., died in Pittsfield, Mass., Aug. 16.

—o—

O. C. Lemke, 76, president of the Underwood Veneer Co., and the Marathon Foundry & Machine Co., Wausau, Wis., died Aug. 17. He was stricken while on business in Milwaukee, and died in a hospital there.

—o—

John Coit, 75, former president of the United States Radio & Television Corp., Chicago, died in St. Petersburg, Fla., Aug. 10. He also had been president of the Radio Manufacturers' Association and of the Simmons Hardware Co., St. Louis.

—o—

Henry DuMars, retired official of the Erie Forge & Steel Co., Erie, Pa., died



F. S. JONES

Appointed general manager, commercial sales for the Western Division, Colorado Fuel & Iron Corp., Denver. Noted recently in STEEL

lumbus, O., are: Dr. Frank C. Croxton, Dr. Clarence H. Lorig, Dr. Howard W. Russell, Ralph A. Sherman, Clarence E. Sims, and John D. Sullivan.

—o—

Claude E. Davis has been appointed

suddenly at his summer home recently. He had served as head of the engineering department at Erie Forge for many years before his retirement.

—o—

Lt. Gen. James G. Harbord, 81, retired chairman of the board of Radio Corp. of America, New York, died recently at his home in Rye, N. Y.

—o—

John A. Taylor, 44, assistant general manager, Bethlehem, Pa., plant of Bethlehem Steel Co., died Aug. 12.

—o—

L. R. Crago, manager of cut nail sales, and also general manager of the LaBelle Works, Wheeling Steel Corp., Wheeling, W. Va., died recently in that city. He had served more than 49 years for Wheeling Steel and predecessor companies.

—o—

T. Rice Davis, 70, retired managing director, Naugatuck, Conn., works of Eastern Malleable Iron Co., died Aug. 12.

—o—

Sam L. Stites, 62, employment manager, Briggs & Stratton Corp., Milwaukee, died Aug. 12 after a sudden illness.

—o—

Harry C. Lutjen, 66, treasurer of L. O. Kovén & Bros., Jersey City, N. J., dealers in tanks and boilers, died Aug. 13 in Montclair, N. J.

—o—

William E. Jones, 81, died recently at his home in Columbus, O. He had been associated with the Ohio Tool Co., Columbus, from boyhood, and later became



E. A. BUXTON

Elected chairman, Committee on Steel Pipe Research, American Iron & Steel Institute. Noted in STEEL, Aug. 18 issue, p. 80

field engineer in the midwest for Good-year Tire & Rubber Co., Akron.

—o—

Leland Hogan has joined Standard Tube Co., Detroit, as vice president in charge of sales.

president. He held that position until 1917, when he retired to go into partnership in the E. T. & W. E. Jones Lumber Co., Columbus.

—o—

Walter M. Heller, 61, treasurer of Heller Bros. Co., file and tool manufacturer of Newark, N. J., died recently.

—o—

Alfred L. Fisher, 47, superintendent of the Laundromat & Iron Division, in the Mansfield, O., plant of Westinghouse Electric Corp., died recently after a year's illness. He had been with the Mansfield plant for 27 years.

—o—

Clinton R. Wyckoff, 72, president and treasurer, Atlas Steel Casting Co., Buffalo, died Aug. 16 at his home in that city.

—o—

Frank O. Miller, 58, civil engineer of the Carnegie-Illinois Steel Corp., Pittsburgh, died recently.

—o—

Lucian L. Kahn, former vice president and treasurer of the Estate Stove Co., Hamilton, O., died recently at his home in San Francisco. He had been active in his business until Jan. 1, 1947, when the company was sold to the Noma Electric Corp.

—o—

Edward C. Wickstrom, construction superintendent, Merritt-Chapman & Scott Corp., Cleveland, marine construction company, was fatally injured in an accident while supervising work his company was doing in Rochester, N. Y.

FINISHING DEPARTMENT

FORM 3706

CUST.	CONDITION		
ORDER			
OPER.	QUANTITY		
MACH.			
FIN.SIZE			
SPEC.	HOT ROLLED SIZE		
BALES AND WEIGHT	FINISH SIZE (1)		
HEAT	BALE	PCS.	WEIGHT
		5 10 15 20 25 30 35 40 45 50 55 60 65 70 75	

By JAMES S. FRESE
*Production Manager
 Steel and Tube Division
 Timken Roller Bearing Co.
 Canton, O.*

Visual

By centralizing planning authority in a production control department relieving operating divisions of burdensome paperwork, one steel company greatly increased percentage of orders shipped complete and on time

TO ANYONE not in the steel industry, the notion that a steel mill can lose several tons of steel in its finishing departments probably seems preposterous. A ton of steel possesses considerable bulk as well as weight. It is not the sort of thing that can slip unnoticed beneath a machine and be swept out by the sweepers. Yet, improbable as it seems, steel mills do occasionally lose tons of steel, just as railroads occasionally lose box cars, unless their scheduling and control systems are carefully organized and operated.

Before we introduced the present control system in the finishing departments of the steel mill at Gambrinus, O., we were experiencing difficulty in processing orders completely; bales of steel were lost because of carelessness; we lost motion and wasted time and effort in the mill departments, on account of the complexity of the scheduling method used; and we were duplicating a certain amount of work in posting identical information in the cost and production departments.

Furthermore, the nature of our old records required the issuance of many change notices—actually more change notices than orders—which were burdensome to the operating departments which had to exercise great care to be sure all change notices were honored in connection with the orders to which they pertained.

A brief outline of the old plan will indicate why we ran into difficulties. The billing department issued an order based on information furnished by the sales department covering material ordered either by the Timken Bearing division or by a customer. This order gave the information necessary for scheduling. Before it was duplicated for distribution to the operating departments, it was processed by the production, inspection, engineering, and metallurgical departments. They analyzed it and supplied necessary information about aspects of the material, routing, processing, and specifications for the guidance of the operating departments.

Copies of the order, size 11 x 17 in. were dittoed and

distributed to each operating department through which the order was routed. Each operating department had clerical workers who cataloged the orders and scheduled material through it. In practice, the effective scheduling was done by clerks in the various operating departments. In each department, these orders were filed in large looseleaf book binders. Reference to an order meant paging through a binder. Change notices had to be incorporated into the original orders. These were issued by the billing departments and so had to follow the same routing

Fig. 1—Machine loading cards are labels for Sched-U-Graph pockets. Long red strips are chopped off to indicate length of time an operation will take on specific machine

Fig. 2—Scheduling orders to operating departments is done from these two 100-pocket Sched-U-Graph boards. Each pocket represents thirty-one 24-hour days of one machine. One board is for current month, second is for following month

Fig. 3—(Top) Schedule card, showing operations, is prepared for use in estimating process time and designating equipment on which work is to be done. (Bottom) Reverse side reflects cost accumulation record



Scheduling System

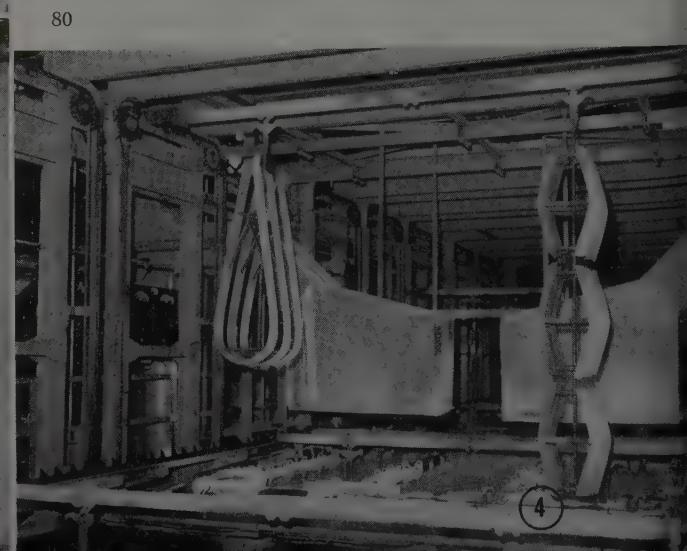
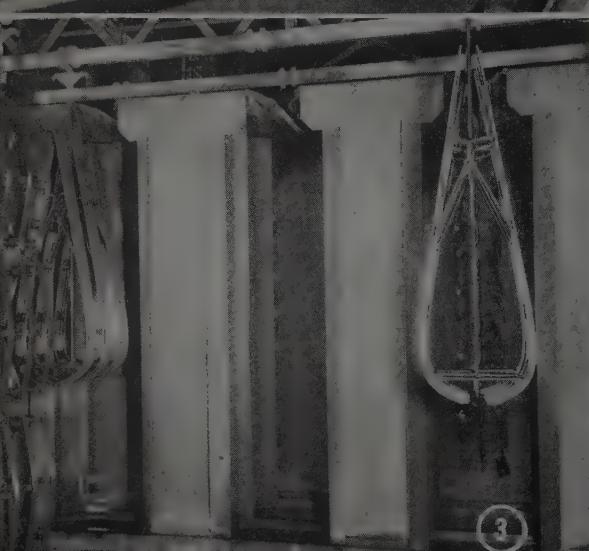
... STEPS UP SHIPMENT OF STEEL ORDERS

as that followed in the original distributing of orders.

The production department operated 24 hours a day on a three crew basis, posting a record of each operation performed on each order. These data were picked up from reports received from operating departments and posted to 11 x 17 in. forms. The continuous posting throughout the 24 hours of each day was necessary in order to know the current location of all orders by bale numbers.

Each day the production department issued to each operating department a schedule on a 9 x 14 in. form showing in detail the order number, bale number, heat number, size, pieces, and weight of orders. This detail schedule was supposed to govern the operating departments. However, as has been mentioned, the clerks in the operating de- (Please turn to Page 111)

Automatic Electroplating



... at Pontiac has capacity for copper-nickel-chrome processing 11,000 stamped steel automobile parts of 11 different basic types every 16 hours

ONE of the largest and most completely automatic copper-nickel-chrome electroplating installations in the world is now in operation at the plant of Pontiac Motor Division, Pontiac, Mich., with capacity for processing 11,000 stamped steel parts of 11 different basic types every 16 hours, or in terms of plated surface an area of 45,000 square feet.

A few statistics on the plating tanks and related equipment will serve to indicate the size and extent of the operation. The single line of plating tanks is divided into three sections. First is for copper plating 207 feet long, and includes 15 automatic operations requiring 90 minutes to complete the cycle. Main copper plating tank contains 58,000 gallons of solution circulating constantly at a rate of 1500 gallons per minute, and filtered at 1260 gallons per minute.

The circulating system passes through 16 heat exchangers to maintain constant temperature of 160-170 F. Three lanes of parts traverse the tanks, carried on 8-foot racks suspended from horizontal bars which in turn are spaced 30 inches apart and move along contact rails at either side of the tanks. A cog chain at the side of the rails propels the loaded bars forward, while separate chain-and-sprocket systems in the machine frame are arranged to lift the load vertically out of one tank, move it on to the next tank and lower it vertically again.

Solution tanks themselves are 12 feet wide and 9 feet deep, set in pits 18 feet wide and 5 feet deep. Height

Line

By A. H. ALLEN
Detroit Editor, STEEL

Fig. 1—From stamping presses, and prior to any plating, these grille blades are positioned on fixtures on conveyor belt which feeds automatic buffing and polishing machines

Fig. 2—Closeup of automatic polisher showing how wheel is shaped and inclined to match contour of steel stamping passing beneath it on conveyor fixture

Fig. 3—Racks of parts, carried in three rows on horizontal bars, enter power wash, first station in plating line. Alkaline cleaning solution is recirculated

Fig. 4—Washed and cleaned parts enter three-lane copper plating tank. Note arrangement of conveyor chain and sprockets at left to raise and lower crossbars from and into succeeding tanks

Fig. 5—View down inside of plating machine, showing exhaust hoods to remove fumes where necessary

Fig. 6—Another view inside plating machine, showing operator standing on catwalk observing progress of parts through various tanks

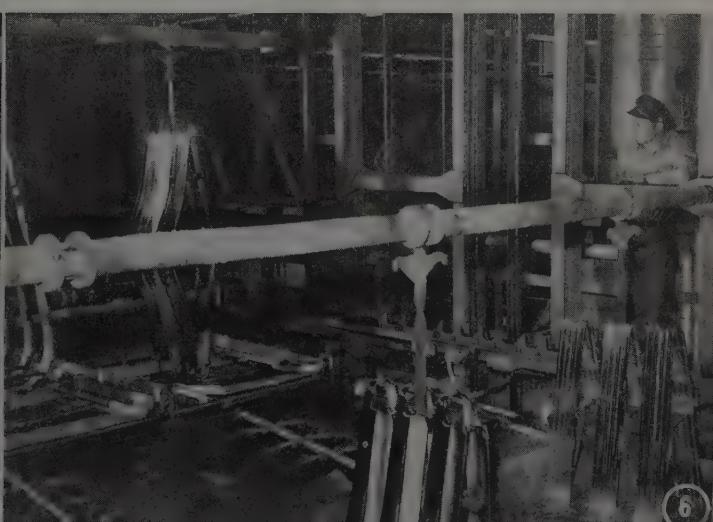
Fig. 7—Between copper and nickel sections, and nickel and chrome sections, racks are automatically transferred from transverse bars which carry them through plating tanks to overhead monorails which transfer them to the buffering department and then to the succeeding plating section



81



5



6

Fig. 8—Maze of motors, pumps, pipelines and heat exchangers required to maintain constant temperature in plating solutions, and to permit rapid recirculation or evacuation of solutions from main tanks to storage tanks

Fig. 9—General view of plating plant from discharge end, showing in foreground dual set of anion and cation tanks for demineralizing water used in system



8

of the machine frame carrying the tracks and chains is 21 feet 7 inches, extending 16 feet 7 inches above floor level.

The nickel section, 250 feet long, includes 14 different tanks and operations, requiring 147 minutes for a complete cycle. The nickel plating tank itself holds 67,200 gallons of solution, equivalent of 8½ tank cars. This solution likewise is filtered constantly and the temperature maintained through 15 heat exchangers.

The chrome plating section is 139 feet long and contains two plating lines through the tanks, in contrast to the three lines traversing the copper and nickel sections. There are ten operations in the chrome section, the main

solution tank having capacity of 15,700 gallons. By having it divided into two compartments it is possible to operate two lanes of work at different cathode current densities.

Some further figures on the overall installation: The machine frame required better than 300 tons of structural steel, while the tanks alone called for over 500 tons of steel. Adjacent to each plating section are storage tanks into which the copper, nickel and chrome solutions may be pumped to permit maintenance work on the main tanks. These storage units have capacity of 158,192 gallons which brings total capacity of all tanks in the system to over 500,000 gallons, or about 55 tank cars. Ventila-

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

DOWN AT COLONEL TOULMIN'S: On Friday, August 15, came a welcome break in my heavy routine duties involved in putting together the September 1st issue of *STEEL*, which in the main will be devoted to the National Machine Tool Show, Dodge-Chicago plant, September 17-26, 1947.

This welcome break was the result of an invitation to a group of industrial editors to be guests of Col. Harry A. Toulmin Jr. at the Hydraulic Press Mfg. Co., Mt. Gilead, O. Colonel Toulmin is chairman of the board of H-P-M, which incidentally is but one of a number of important engineering and industrial enterprises in the management of which he is actively concerned.

Hydraulic Press Mfg. Co. has indeed come a long way since it was established in 1877 to build cider presses. A sign in front of its fine new plant, located literally in the corn fields and orchards a considerable distance outside the typical central Ohio country town, proclaims it now to be the largest builder of hydraulic presses for indus-

trial use. That I well can believe after my interesting day at this new plant and at an older plant closer to town.

There are no "iron curtains" around what is going on at H-P-M. It is Colonel Toulmin's policy to let the world know what is going on there. By the same token, Colonel Toulmin sees to it that many things are going on in advancement of the art of hydraulic actuation of presses and in their application to a constantly growing number of techniques, including metal forming operations, injection molding of rubber and plastics, die casting, etc.

In these activities the engineers at H-P-M are aided and abetted by others at Hydro-Power, Inc., a wholly owned subsidiary in Springfield, O., which specializes in building of hydraulic pumps, valves and controls for presses and for any other purposes to which hydraulics profitably can be applied—not only in manufacturing operations but also in materials handling, road machinery, the trucking industry and elsewhere. Engineers of both companies in turn are aided and abetted by research work carried on at Commonwealth Engineering Co. of Dayton, O.

During our day with Colonel Toulmin, a number of his associated experts in hydraulic techniques gave talks on latest applications to high speed inclinable presses, to injection molding of rubber products, to plastics molding, to high pressure die casting; also on "packaged hydraulics" and hydraulic trends. These papers were "pointed up" by working demonstrations of equipment involved.

Without going into details as to these interesting papers and convincing demonstrations, I do want to bring out two points. One is that these H-P-M engineers and their associates deal with hydraulic circuits exactly the way electrical engineers deal with electrical circuits. They think of the pump as a "generator" which transforms me-



tion of all tanks requiring it is handled by 32 blowers with capacity of 434,000 cubic feet per minute. Better than 4200 tons of concrete and 92 tons of reinforcing steel were required for the 19,000 square feet of concrete surface adjoining the system. An estimated 90 tons of sheet steel were required for the exhaust ducts.

Soft water for the plating solutions, rinses and other tanks is supplied at the rate of more than 50 gallons per minute by a system of anion and cation demineralizer tanks and aerators, reducing mineral content of the water to less than 20 parts per million. A dual system permits regeneration when required.

Parts handled in the plating work include radiator

grille blades, center decorating strips for hoods, bumper guards and occasionally some service parts for earlier models. Most of them are of cold-rolled steel, around 22-gage. All are polished before the initial copper plating. All parts are buffed after the copper plate, and some after the nickel plate, long lines of both automatic and hand buffering machines adjoining the plating line, and conveyor lines routing parts to the buffering departments from the discharge end of the tanks by means of an ingenious transfer system. Parts are re-racked after buffering and before entering the nickel and final chrome plating sections. Sequence of operations in the copper plating section is as follows: (Please turn to Page 126)

chanical power into a "flowing" form of energy which readily is transmitted—by tubing instead of wires—to points where it again is changed back into mechanical energy, as behind the ram of a press.

They even employ "transformers" in the form of pressure booster units which take in a larger volume of fluid at normal pressure and deliver a smaller volume at greatly increased pressure—as, for instance, for the final, brief, "big squeeze" in the press-forming operation of a metal part.

The action of these booster units reminded me of the "hydraulic rams" which I used to see in action on farms in Vermont—which "bumped" small amounts of water to high levels through action of a large flow of water under low head". However, there are no "bumps" in the action of the H-P-M boosters. They are mechanisms of extreme precision which deliver a smooth flow of "concentrated power".

The other point that I want to bring out is that Colonel Toulmin and his engineers are "conservationists"—not only of materials, through economies involved in hydraulic press manufacture of parts—but also of hydraulic power, through its efficient generation, its "rationing" to minimum required for each phase of the operating cycle, and its efficient transformation back into mechanical power at points of use.

I will not go into details as to how this conservation of power is accomplished, other than again to point to the pressure booster unit already mentioned, and to add that flywheels are employed on their hydraulic units to enable motors of normal horsepower to store up sufficient energy to "carry over" the occasional, brief periods where heavy peak loads are imposed. I long have been an advocate

of power conservation in the manufacturing plants of America. I have written a number of articles on use of flywheels on machine tools to further the cause of power conservation in the metalworking industries. It certainly did my heart good to discover that Colonel Toulmin and his associates are on my side in this rather controversial matter.

Walter Ernst, vice president in charge of engineering, Commonwealth Engineering Co., Dayton, O., expressed our sentiments exactly during the sessions at Mt. Gilead, when he said: "The depletion of our natural resources makes it mandatory that all of us look to the conservation of these resources, and it follows that conservation of all forms of energy is a necessary preoccupation of every engineer".

THE 48-MINUTE HOUR: In the course of my recent expedition among machine tool builders in the Michigan-Wisconsin-Illinois territories, I became aware of some literal interpretation of human efficiency.

At Gisholt Machine Co., Madison, Wis., I was shown an interesting production machine which, I was told "turns out so many of such-and-such an automobile part in a 48-minute hour".

"What", I inquired, "is a 48-minute hour—don't they still have 60 minutes?"

"So they do, as far as clocks are concerned," admitted my Gisholt friends, "but one of the facts-of-life which we face today is that the average production operator actually works only 48 minutes out of every hour. The other 12 minutes are dedicated to other more personal activities. Therefore we rate our machines on the basis of the 'human hour' instead of the 'clock hour'."

Tools Revolve

About Work in

TURNING LARGE

One crankpin turning machine, construction details of which are discussed here, cheeks, turns and fillets crankpins or bearings from rough forgings to finish sizes with an accuracy of 0.001-in.

EFFECTIVE methods for turning crankpins on large diesel-type crankshafts, intermediate main line bearings and end bearings are in a large part dependent upon the skill of the designer of the turning machine. An examination of the construction details of a crankpin turning lathe built by Wickes Brothers, Saginaw, Mich., reveals careful utilization of sound engineering principles that enable crankpins as large as 20 in. diameter to be turned with less than 0.001-in. out of round.

According to Wickes engineers, no crankpin turning machines of this type were built in this country until World War II. Any machines in operation here were imported from Europe. Beloit Iron Works, Beloit, Wis., completely designed their own machines which were capable of much heavier work than the European types. They were provided with power feed including power rapid traverse not only for the longitudinal motion of the ring but also for the tool feed in the ring. Recently Wickes took over production of the Beloit-type machines.

This crankpin turning lathe supports the crankshaft in a stationary position on stanchions. Main bearings are held by sets of V-blocks which put the center line of the main bearings on the center line of the rotating ring when throw is set at zero.

Crankpin to be machined is set up with the throw horizontal; exact amount of throw is determined by moving the ring housing with respect to the carriage on the bed in a direction at right angles to the longitudinal axis of the machine. Crankpin is then located on the center line of rotation of the face plate. The ring rotates around the crankpin with tools moving and the work remaining stationary.

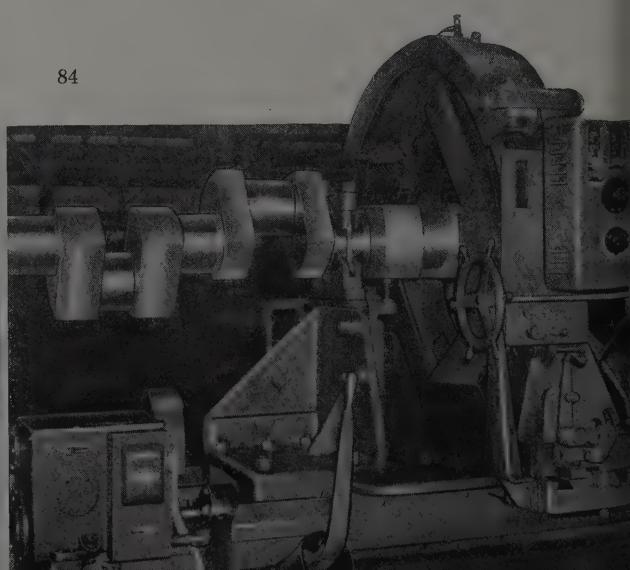
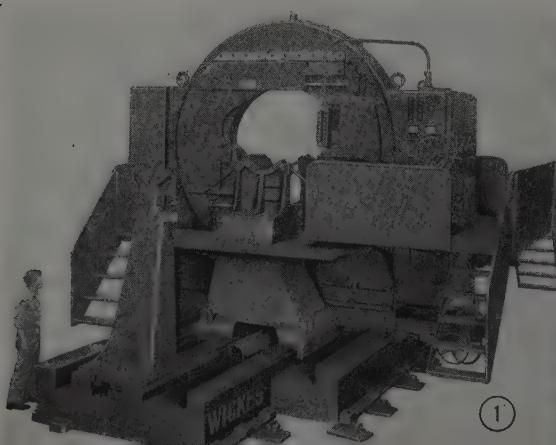
By means of a radial feed, two tools on tool slides are moved in and out to the cutting diameter as required by the particular operation. To machine length of pin and distance across heels, carriage and ring housing assembly are moved longitudinally on the main bed. Additional steady rests support the overhung ends of the crankshaft in addition to the two stanchions which are close to the work being machined.

When one pin is completely machined, either the carriage is moved along on its bed to machine the second pin, or the crankshaft is shifted in the stanchions to the new position to accommodate the next pin. After the first pin is machined, a protractor is attached to the crankshaft and remains until all the pins have been machined. This protractor is provided with an accurate machinist's level and is graduated in degrees. First throw is set on zero. Next, the operator moves the protractor through a suitable number of degrees to give the difference between the first and second pins to be machined. Then the crankshaft is rotated until the level reads zero again, putting the pin in its correct position.

Taking up the parts of the machine in detail the heavily constructed bed has flat ways and was designed to accommodate the main ring housing carriage and at the same time provide for the necessary stanchions. In the larger sizes of the machine, the bed is extended so that outboard steady rests also are accommodated on a reduced section of the main bed.

Stanchions supporting the work clamp the main bearing journals adequately during various machining operations. Spacer block of special chilled cast iron accommodate various shaft diameters. The new blocks have been found to stand up well under wear and abuse received in holding and changing the crankshaft from position to position.

Main carriage is fitted with (Please turn to Page 122)

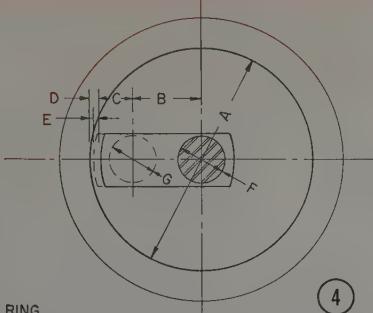
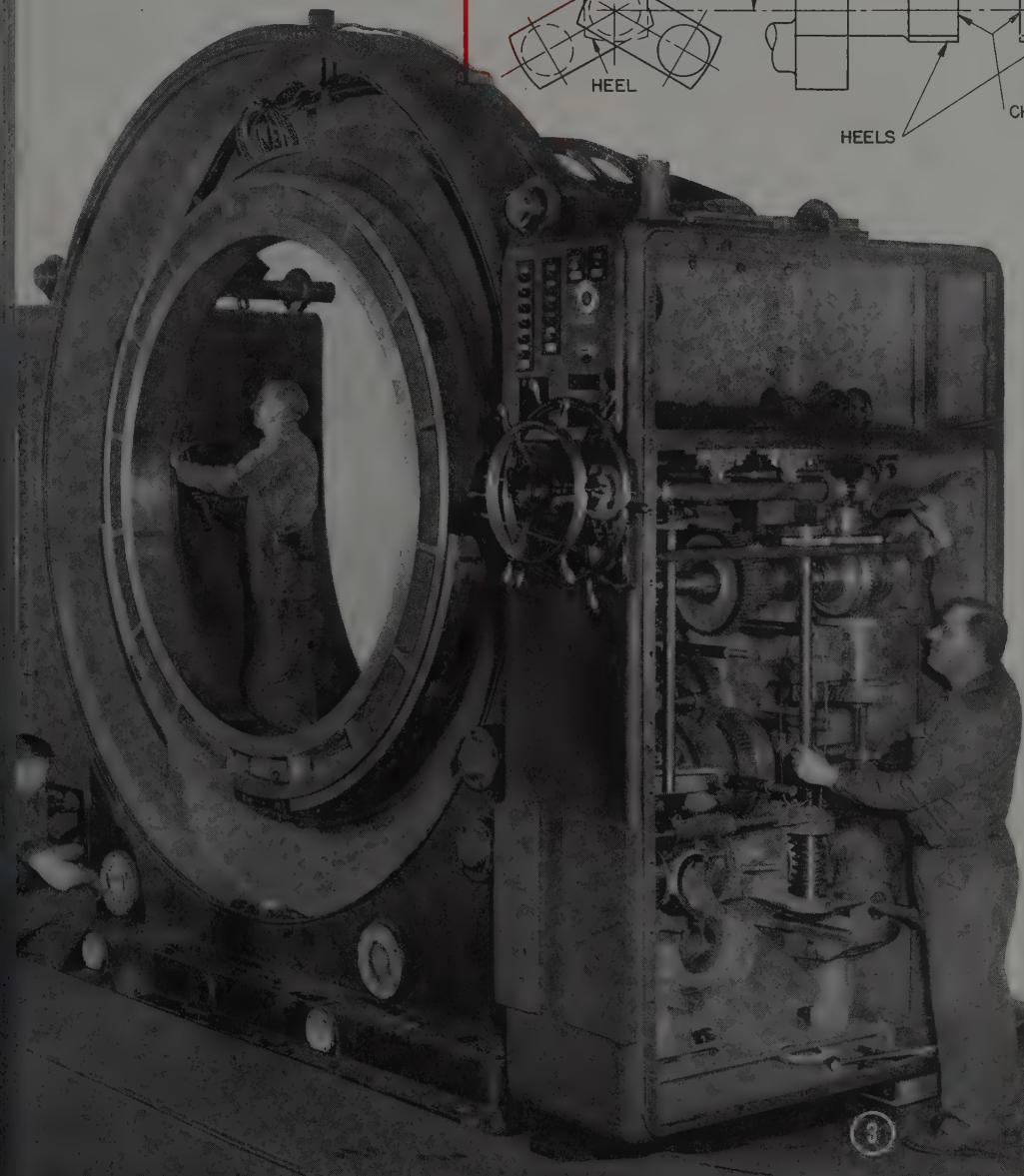


CRANKSHAFTS

Fig. 1—Crankpin turning machine completely cheeks, turns and fillets crankpins or bearings from rough forgings to finish sizes with accuracy of 0.001-in.

Fig. 2—Turning heels on a crankshaft

Fig. 3—Main ring housing, bearing and gear box. Pressure gages at far left indicate oil pressure before and after filters, in addition to pressure in lines supplying main bearing and gearbox bearings and gears

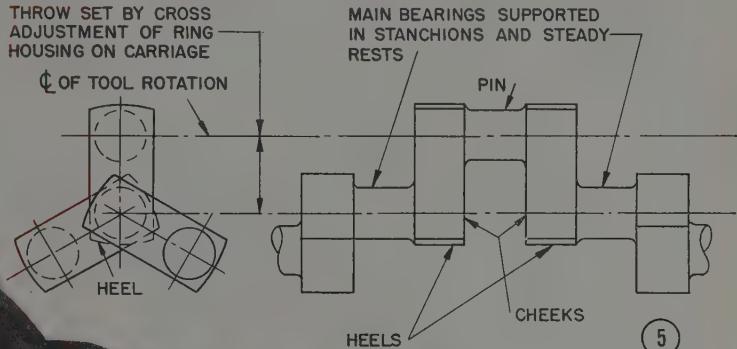


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A=INSIDE DIAMETER OF PIN TURNER RING
B=THROW OF CRANKSHAFT
C=DIMENSION FROM C. L. OF MAIN BEARING
TO END OF WEB
D=CLEARANCE

E=STOCK REMOVED FROM RGH. FORGING
F=MINIMUM PIN DIAMETER
G=MINIMUM & MAXIMUM MAIN BEARING DIAMETER

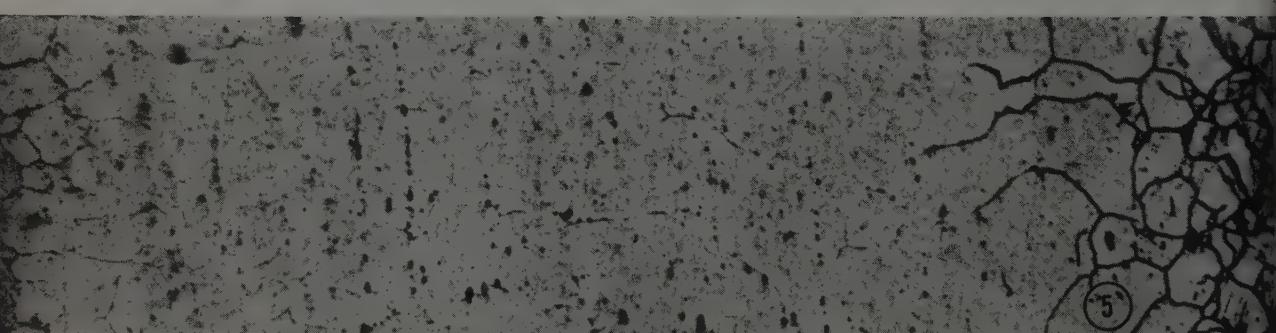
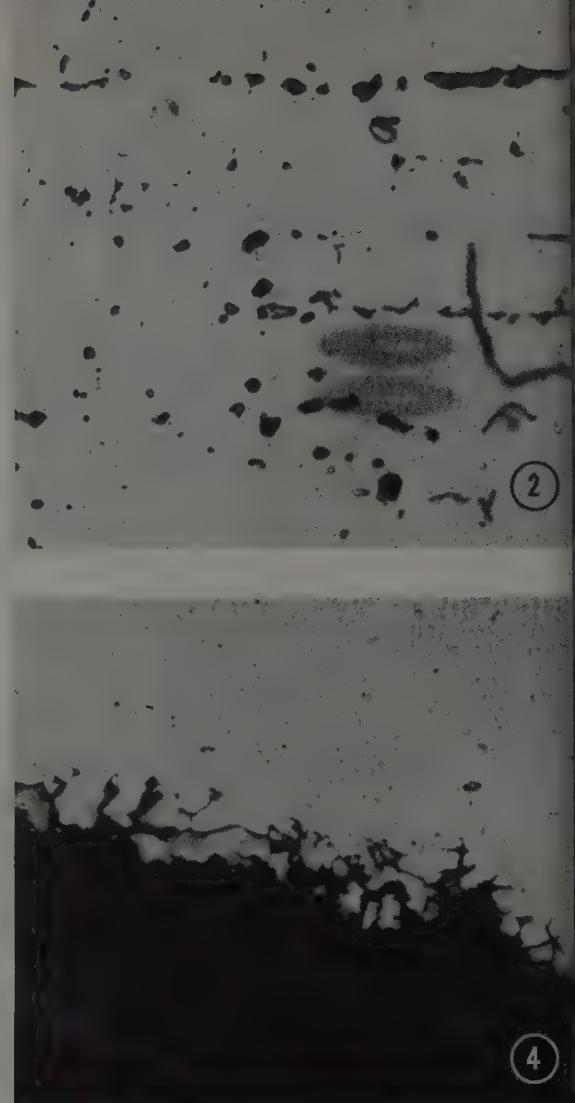
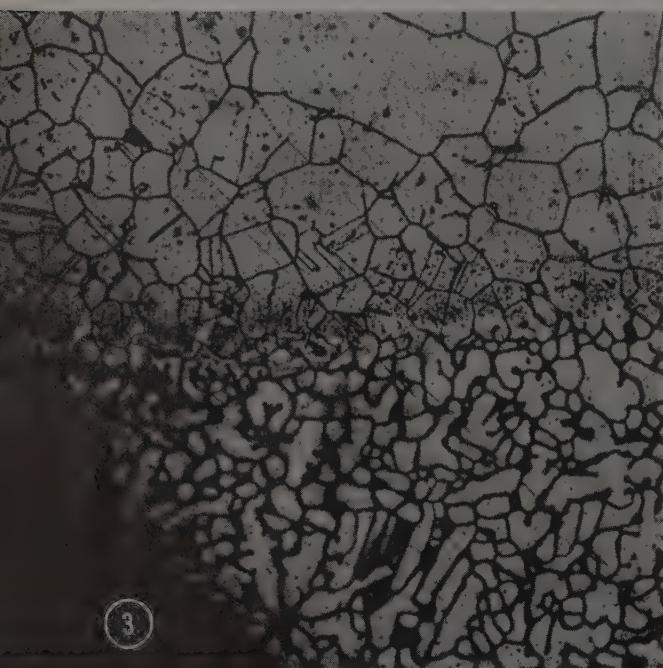
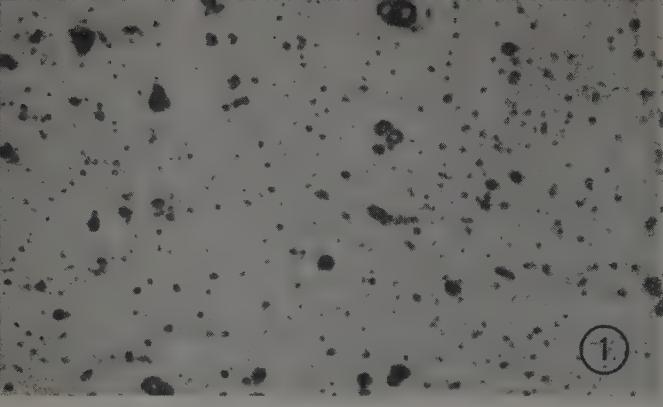
$$2 \times (B + C + E) = \text{MAXIMUM TOOL CUTTING DIAMETER}$$



5

Fig. 4—Method of figuring size of machine necessary for requirements. A. Inside diameter of pin turner ring; B. throw of crankshaft; C. dimension of C. L. of main bearing to end of web; D. clearance; E. stock removed from rough forging; F. minimum pin diameter; G. minimum and maximum main bearing diameter; $2 \times (B + C + E) =$ maximum tool cutting diameter

Fig. 5—Work performed by crankpin turning machine



Serviceability tests on welded aircraft exhaust manifolds indicate that by heating titanium and columbium-stabilized types 321 and 347 steels for 30 minutes at 1650° F, some small beneficial results are realized—improved resistance to attack by corrosive aqueous solutions and electrolytes

AS A RESULT of the rather conflicting information available concerning the effect of stabilizing and stress relief heat treatment upon welded 18-8 stainless steel, the Ryan Aeronautical Co., San Diego, Calif., recently concluded a series of investigations on this subject. These tests were designed to determine particular benefits, if any, which might be imparted by these processes to 18-8 type 321 and type 347 stainless steels for use on exhaust manifolds. Benefits which would be reflected in greater serviceability of the aircraft exhaust manifolds manufactured from this steel were of prime importance to this inquiry.

When 18-8 type stainless steel was first used on aircraft exhaust manifolds, it was soon discovered that the material was rapidly attacked by the exhaust gases. Closer investigation disclosed that carbides formed were not resistant to the products of combustion encountered in exhaust gases. This led to the use of stabilized grades type 347 and 321.

Review of available literature shows that addition of columbium and titanium contained in these types was not the only means utilized to affect the stabilization of the material, but that stabilization was enhanced by a special heat treatment. This consisted of holding the fabricated

Fig. 1—Photomicrograph showing random distribution of carbides in type 347 (columbium-stabilized) stain-carbon (0.025 per cent) type 304 stainless after sensitization. 500X, enlarged 2X

Fig. 2—Random distribution of carbides in special low sensitization. 500X, enlarged 2X

Fig. 3—Etched photomicrograph of weld zone of stainless exhaust manifold section after 4000 hours service. Note well-defined networks of carbides which did not affect its service life. 100X, enlarged 2X

Fig. 4—Unetched photomicrograph of weld zone of exhaust manifold after 4000 hours service. Depth of corrosion during life of manifold was only 0.005-inch. 100X, enlarged 2X

Fig. 5—Etched photomicrograph of stainless exhaust manifold section in service 100 hours, showing progressive precipitation of carbides from inside surface of manifold. 100X, enlarged 2X

Fig. 6—A, photomicrograph showing corrosive attack on section of aircraft exhaust manifold in service for more than 4000 hours. B—Same material after treatment with copper-sulphate-sulphuric acid (Strauss solution) bath for 48 hours. Note extreme attack. 100X, enlarged 2X

EFFECT OF

Stabilizing AND Stress Relief

Heat Treatment for 18-8 Stainless

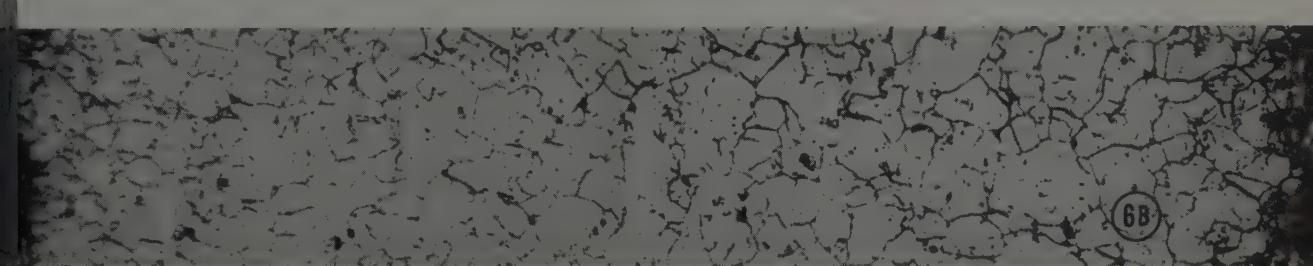
By WILSON G. HUBBELL

Metallurgical Section, Laboratory
Ryan Aeronautical Co.
San Diego, Calif.

part within a narrow temperature range of about 1575 F to 1625° F for periods of time exceeding ½-hour, stabilizing the carbon by precipitating it as titanium or columbium carbides in random dispersion, Fig. 1, within the austenite grains.

Result is that no carbon is available for the formation of harmful chromium carbides if the material is to be used within the so-called sensitizing range of approximately 900—1500° F. In theory, without this stabilizing heat treatment and with the carbides in solid solution in a properly annealed austenitic steel, available carbon might conceivably combine with chromium carbides, and not with those of columbium or titanium. This could occur when the finished part was raised to the operating temperatures within the sensitizing range.

It is agreed, therefore, that the theory behind the stabilizing heat treatment on the stabilized grades of stainless steel is correct, and from the standpoint of resistance to corrosion in electrolytes and highly corrosive solutions, the stabilizing heat treatment may be required. However, correlation between corrosion under these conditions and resistance to the type of corrosion obtained from exhaust gases in exhaust manifolds is not satisfactory. The specification analyses covering the minimum amounts of columbium and titanium allowable in 18-8 stainless steels are such that adequate stabilization of the carbides



6B



is present for exhaust manifold use without special heat treatments.

Substantiating facts have been accumulated by Ryan laboratories which show exhaust manifolds will resist corrosion where a combined precipitate of chromium carbides exists after sensitizing the annealed material. To account for this, photomicrographs were taken which show that even throughout the annealing heat treatment accomplished by cooling in air from 1950 to 2000° F, a percentage of the carbon will remain combined with the chromium if held within the sensitizing range for a sufficient period of time.

The amount of available carbon left for the formation of chromium carbides is very small. Fig. 2 shows how the carbides after sensitization are distributed in an 18-8 type unstabilized stainless steel having 0.025 per cent carbon content. From this, it is safe to assume that uncombined carbon of 0.025 per cent and possibly up to as high as 0.04 per cent, can be tolerated without fear of intergranular attack by exhaust gases.

Reason for this is that the available carbon is so rapidly depleted in combining with the chromium that it remains in broken particles dispersed irregularly along grain boundaries. This condition leaves no continuous path for corrosion to take as in the case of a relatively high carbon, unstabilized 18-8 stainless steel. The microstructure of a completed exhaust manifold fabricated from type 347 or type 321 stainless steel shows columbium or titanium carbides at random dispersion within the austenitic grain and a dispersion of chromium carbides along

gain boundaries spaced at such distances apart as to be no cause for concern over the ultimate serviceability of the exhaust manifold.

Fig. 3 is a photomicrograph of a weld zone taken from an exhaust manifold which had been in continuous service from 1938 to 1944. Total flying hours accumulated during these years approximates 4000 which is in excess of the normal life of an exhaust manifold. This part was returned for the replacement of an exhaust port which had become worn by mechanical means.

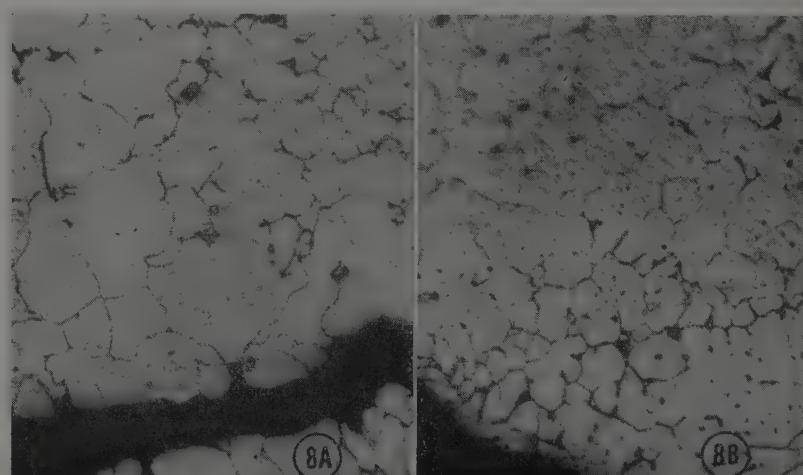
No breakdown of the metal in the form of cracking or corrosion was noted with the exception of an attack which had progressed to not over 0.005-inch on the inside surface of the body of the manifold. According to the criteria by which stainless steels and stainless steel welds are judged in many specifications, the photomicrograph of this manifold would be cause for great concern. This is due to the heavy network of carbides progressing throughout the original sheet, and an even heavier network in the region of the weld zone.

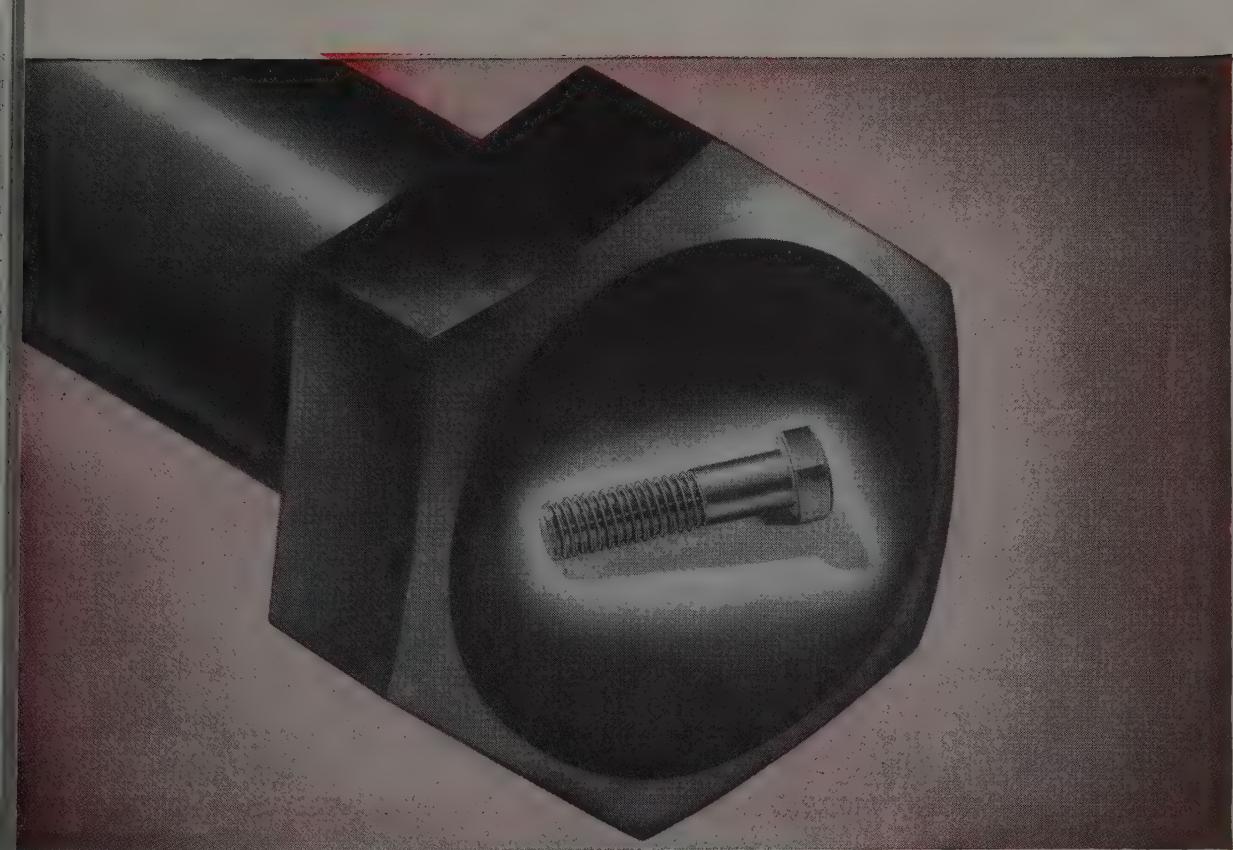
Yet the photomicrograph (unetched) in Fig. 4 showing the depth of the corrosive attack by exhaust gases quite conclusively indicates that the presence of the carbides, even with their continuity becoming more definite, does not contribute to an excessive cause for corrosive attack by the exhaust gases. This bulwarks the contention that there is little or no relationship between the life of an exhaust manifold and the strict condition that all carbides must be combined with the

(Please turn to Page 114)

Fig. 7—Four photomicrographs showing arc-welded zones of both columbium and titanium-stabilized stainless in sensitized and unsensitized conditions after being Strauss-tested. There appears to be no appreciable difference as indicated by intergranular corrosion. 100X, enlarged 2X

Fig. 8—Two photomicrographs of gas-welded zones of columbium and titanium-stabilized stainless in sensitized condition after Strauss test





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Engineering News at a Glance

EASY ON FREIGHT BUDGET: Adoption of palletized shipping and use of compartmented folding containers for its air cleaners recently brought about a sizable reduction of shipping costs for Donaldson Co. Inc., St. Paul, it was learned from Clark Trucktractor Co., Battle Creek, Mich. The new collapsible containers holding from 20 to 300 air cleaners, each in a separate compartment, effected a saving in packaging cost alone of 40 per cent. Loaded container is protected top and bottom with caps of 0.04-gage aluminum, and is then wire strapped to a 42 x 48-in. Clark expendable pallet with round legs of corrugated paper board. Pallet is well adapted for truck handling, and its light weight—5½ pounds—resulted in a saving of 94½ pounds in shipping weight per unit.

INTERNAL AERODYNAMICS: New field of technical specialization, internal aerodynamics, may offer the most immediately effective path for improvement of jet aircraft performance. Rapidly emerging importance of this field is indicated by recent formation of a special subcommittee on internal flow by the National Advisory Committee for Aeronautics, to recommend special research programs in the science of handling air inside the plane. Pointing up the increasing magnitude of the problem is the fact that a 10 per cent increase in air handling efficiency in a standard turbojet engine could mean a 30 per cent increase in thrust output or a reduction in fuel consumption, saving as much as 525 gallons of fuel in a 4-hour Lockheed P-80 flight.

TO DISTRIBUTE EQUIPMENT: From Matawan, N. J., Hanson-Van Winkle-Munning Co. reports that besides perfecting four grades of a new liquid tripoli polishing composition, it recently entered into an agreement with Eclipse Air Brush Co. for the distribution of their equipment for applying the compositions. The compositions may be used with any approved spray equipment, but if the operator has never used liquid compounds before, the Eclipse equipment is recommended.

STEPPED-UP STAINLESS WELDING: Welding with stainless steel powder may be accomplished at a rate about twice as fast as with the conventional welding rod by using a torch developed by Powder Weld Process Co., Brooklyn, Charles Hardy Inc., New York, reports. Due to very high flow rate of stainless powder developed for this purpose, ap-

plication of the metal at exact point where it is wanted can be carried on at a maximum rate of 1 cubic inch of metal powder in about 18 seconds through a ½-inch orifice. The stainless powder can be applied with an acetylene flame and with precise adjustments for balancing flow of metal to the quantity of gas and air employed.

PACKAGES POWDER METALLURGY DATA: Collection of 2253 patents on powder metallurgy, classified in related groups with a short abstract for each invention is now available to industry, according to the National Bureau of Standards, Washington. Representing more than a century of progress in this art, the information was compiled following an extensive study of patent literature in connection with an investigation on powder metallurgy by the bureau. Listing is classified as to production, handling and working, alloying and application.

WIRE BY THE MILE: A strand of wire reaching from Chicago to Louisville, a distance of 276 miles as the crow flies, can be produced from a "chunk" of copper no larger than a standard baseball. The wire, produced by North American Philips Co. Inc., New York, is used for hearing aids and sensitive electrical measuring instruments.

PREVENTS SPARKING: An electronic "spark guard", so sensitive that it can be set to anticipate an accidental short and de-energize the electrostatic field before a spark-over develops, was announced recently by Harper J. Ransburg Co., Indianapolis, for its electrostatic spray coating and dip-detearing processes. The device stops the equipment automatically should the work accidentally approach the discharge electrode, either from swinging, falling or from some other dislocation. Plans are under way to supply the development to all present users of the firm's electrostatic spray and detearing equipment, and to include it in all future installations.

AIDS SMALL ENGLISH FIRMS: Newest venture in the field of industrial research in Great Britain is the Fulmer Research Institute, formally opened recently by Sir Stafford Cripps, president of the Board of Trade. Founded by a group of firms, mainly engaged in the preparation and processing of high duty alloys, the institute is a nonprofit organization. Its objective is to provide research facilities for small and medium size firms unable to set up their own laboratories. Sponsored work is to be

carried out on a strictly confidential basis. For the present, research will be confined to the metallurgical field, embracing all metals and alloys.

TO EXTEND BEARING LIFE: To be shown for the first time at the Machine Tool Show, Sept. 7, Chicago, an oil mist lubricator, developed by SKF Industries Inc., Philadelphia, extends average life of grinding spindle bearings as much as several thousand hours. It also saves up to 90 per cent of lubricants, according to tests. The lubricator produces a mixture of air and oil under pressure, flowing the mist through the bearings, then the seals, exhausting it in the air. Because of its finely divided state, the oil mist can carry long distances through connecting lines without separating out or collecting in pockets. As many as 12 machines can be serviced by the development.

NYLON GRIPPERS: Faults common to old style fasteners are eliminated by the use of nylon as the selflocking element of nuts, it was learned from E. I. DuPont De Nemours & Co., Wilmington, Del., recently. Bonded within the metal nut, the nylon serves to grip the threads of an inserted bolt so tightly that it cannot loosen. Army-Navy specifications previously limited removal and re-use of lock nuts to 15 times. Tests made by two manufacturers, Elastic Stop-Nut Corp., Union, N. J., and Nylok Corp., New York, indicated many times this number of removals can be made with the nylon element. They showed the nut required a torque that is only a few inch-pounds under that used to remove it the first time.

CRANKSHAFT EVERY 24 MINUTES: Giant machine for turning milling crank pins and adjacent web faces of diesel motor crankshafts, discovered by investigators in Germany, is reported to finish a crankshaft in 24 minutes compared with 160 minutes by previous turning methods. According to the Office of Technical Services, Washington, a 40-inch diameter cutter was used for the work. In the turn milling operation the crankshaft is mounted between centers and supported additionally by journal rests on two finished main bearings of the 150,000 to 200,000-pound machine. Six cutters mounted on spindle carriers are spaced at intervals of 120 degrees about the axis of the crankshaft. Two of them are located vertically under the crankshaft and two on each side of the shaft 30 degrees above the horizontal.

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Study of adherence of silver to steel shows that bond is improved when diffusion of silver into iron and iron into silver takes place by heating

Silver Plating Facilitates

Bonding Glass to Steel

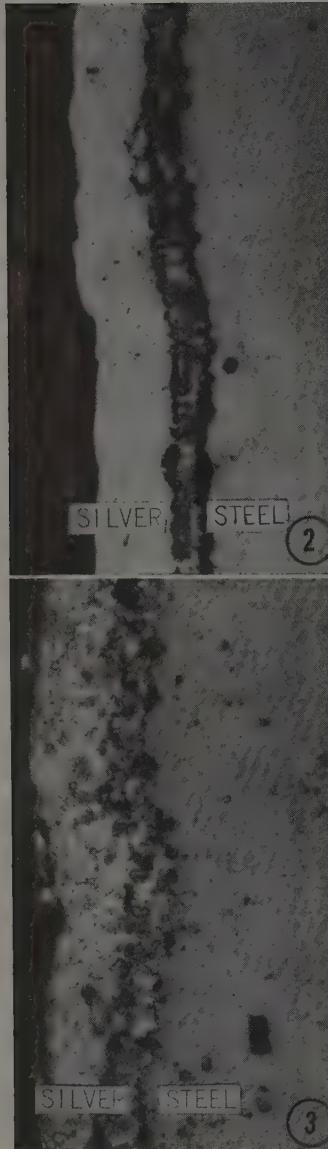


Fig. 1—Silver-plated SAE 1113 steel. Formation of blisters in plane perpendicular to direction of slag lines is evident. X250

Fig. 2—Silver-plated steel fired in air at 800° C for 5 minutes. Note diffusion of iron oxide into silver. X1000

Fig. 3—Silver-plated steel, after firing in air at 800° C for 5 minutes, was heated in hydrogen at 800° C for 10 minutes. Note reduced iron dispersed in silver phase. X1000

METHOD of bonding glass to steel whereby the steel is first silver plated to produce a coating that will withstand the high temperature encountered in processing was described by Norman S. Freedman, tube department, RCA Victor Division, Harrison, N. J., before the 91st general meeting of the Electrochemical Society at Louisville. A study of the adherence of silver to steel showed that the bond is improved when diffusion of silver into iron and iron into silver takes place by heating. Electro-deposited silver-layer-on-steel construction was developed for and used in the manufacture of small, high-frequency tubes.

Fabrication of an electron tube requiring a glass-to-metal disk seal involves both electrical and mechanical considerations. Because of the "skin effect" phenomenon of ultra-high-frequency electric conductivity, surface of the metal tube parts must be an excellent conductor and the conductivity must not seriously change with age or with the method of bonding the glass to the metal. Because of mechanical problems, the sealing of a metal disk to a glass cylinder requires

that the expansion characteristics of the metal and glass match.

Electric surface-conductivity of silver does not deteriorate seriously under ordinary atmospheric conditions. In addition, the glass-to-silver seal is made by diffusion of silver into the glass and does not depend on or result in the formation of any oxides. Difficulties involving high cost of solid silver and of obtaining a commercial glass matching the thermal expansion of silver were solved by using silver plated on steel. The silver layer possesses good glass-sealing properties and the required electric conductivity, while the steel matches the thermal expansion of a commercially available glass. Silver layer on steel must neither blister nor deteriorate under the high temperatures required in making the glass-to-metal bond.

Since little information was available on the performance of silver-plated steel under the extreme temperature conditions of tube manufacture a study was carried out in the RCA tube department on the nature of the adherence of silver to steel and of glass to silver, along with the development of a satisfactory

TABLE I
CURRENT REQUIRED DURING SILVER "STRIKING"
AND PLATING

Batch Size Pieces	Strike			Plate		
	Current Amp.	Time Minutes	Current Amp.	Time Hours	Deposited mg./part	
Shells	200	18	4	15	8 1/2	500
Washers	1,000	20	4	10	5	150
Skirts	800	20	3	30	2	350

TABLE II
CONCENTRATION OF BATHS USED DURING "STRIKING" AND PLATING

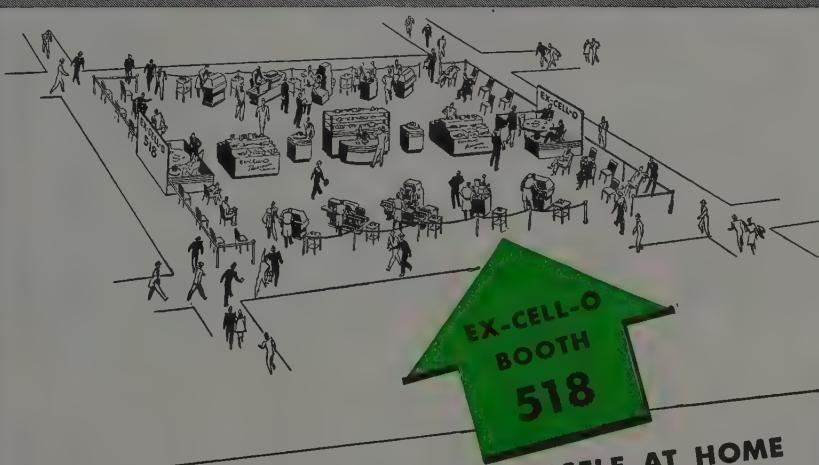
	Strike	Plate
Silver	0.2 to 0.4 g/L	15 to 17 g/L
Free Cyanide	50 to 60 g/L	25 to 30 g/L
Sodium Carbonate	Start 12 g/L*	Start 12 g/L*

* Upper limit on Na_2CO_3 has not been determined, but as much as 35 g/L caused no difficulty.

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process for the electrodeposition of silver on steel.

Steel parts to be plated were given a thorough preplating cleaning treatment using standard techniques for degreasing, and acid pickling. Plating method involved one "strike" procedure and because the production program called for the eventual plating of a large number of small parts, tumble plating was chosen as the most satisfactory method for this type of work. Tanks having all welded steel construction were used with a hexagonal laminated bakelite barrel rotating at 6 rpm. This speed was chosen to keep scratching of the parts at a minimum. The plating barrel with its driving mechanism was mounted on a track so that the barrel could be raised and moved from one tank to the other.

Table I gives the amount of current and the length of time for "strike" plating. Salt concentration limits of the "striking" and plating baths are restricted in Table II.

Many metal parts required for tube manufacture are drawn and punched. The selection of a steel for these parts was based on its drawing qualities. SAE 1010 was chosen because it is a deep-drawing steel that is easily plated.

In work at RCA, an easy machining steel, SAE 1113 was first tried for fabricating these parts, but difficulty was experienced in the adherence of the silver to the steel after the high temperature processing. Blisters, evidenced by separation of the silver from the steel were encountered, especially on the faces

of the parts perpendicular to the direction that the steel stock was rolled.

Microscopic examination showed that blisters occurred most prominently at the points where surface of metal intersected slag lines. Fig. 1 is a photomicrograph of the silver-plated SAE 1113 steel. Blisters were attributed to the high sulphur content.

Bond Maintenance Prime Criterion

Because the steel parts are not mechanically shaped, formed or stressed after silver plating, mechanical adherence of silver to steel is not a prime concern. Maintenance of an intimate, hermetically tight bond between silver and steel after high temperature heat treatment is the prime criterion of a satisfactory plate. It is doubtful if there is a set of criteria that would positively distinguish a hermetically tight bond from a bond through which air would leak. The appearance of blisters and the separation of the silver from the steel are, therefore, the practical criteria of adherence.

After silver plating, steel parts are fired in an atmosphere of hydrogen at 800°C for 10 minutes. It was learned that the hydrogen firing schedule actually improved adherence of electroplated silver layer to the steel.

During the course of work at RCA it was found that certain batches of silver-plated steel parts not previously fired in hydrogen after plating, would blister on heating by high-frequency induction in air for the sealing-to-glass operation. However, blistering during the sealing-

to-glass operation does not occur if these parts are first fired in hydrogen. Silver adherence for such a batch of "just passable" parts is improved by the hydrogen firing, which is additional evidence for the hypothesis that hydrogen firing improves adherence of silver to the base metal, steel.

Improvement in adhesion was due to alloying and diffusion of iron into the silver and alloying and diffusion of silver into the steel. Alloying and diffusion of iron into the silver was demonstrated by black x-ray diffraction data and discoloration (oxidation) during air firing at 800°C of the iron-silver alloy formed previously during heat treatment at 800°C in hydrogen for an extended period of time.

It was found that on heating in hydrogen at 800°C diffusion of iron to the surface of the silver occurred between 24 and 44 hours. Saturation of silver with iron at the surface occurred between 44 and 68 hours. When the silverplated steel parts were heated at 800°C in air, oxygen diffused through the silver and oxidized the steel at the steel-silver interface to form iron oxide, some of which readily diffused out through the silver towards the silver surface. The presence of a thin oxide layer beneath the silver at the steel interface was found not to be harmful provided the layer was a film rather than a scale.

Fig. 2 shows a silver-plated steel specimen heated in air at 800°C for 5 minutes. Actually this length of time is greater than that used in seal making but was chosen to show the effect more clearly. Diffusion of iron oxide into silver is extensive, as evidenced by the dark oxide layer within the silver layer. Upon refiring at 800°C in hydrogen, the iron oxide reduces to iron. Fig. 3 shows the iron dispersed within the silver phase after firing in air at 800°C for 5 minutes and heating in hydrogen at 800°C for 10 minutes.

The glass-to-silver-plated-steel bond is made by heating silver plated steel parts by high frequency induction in air to reach a temperature of 760° within 30 seconds. This is followed by annealing in air at 400°C for 20 minutes and slow cooling to room temperature. Optimum silver thickness is 0.0007 to 0.0015 in. Glass-to-metal seal is effected by diffusion of hot silver into the softened glass as evidenced by the yellow coloration of the glass near the seal.

—o—

Available with tips $\frac{1}{4}$ and $\frac{1}{8}$ in. in diameter, the Calrod Midget soldering iron for precision soldering where space is limited is announced by General Electric Co., Schenectady, N. Y. Only 8 in. long, it is rated at 25 w 6 v and is used with 115/6 v insulating transformer. A transformer providing four taps for variable heat is also available.

NEW LITERATURE

AC WELDERS FOR HELIARC WELDING
By Miller Electric Mfg. Co., Appleton, Wis. Four-page, illustrated bulletin describing uses and standard and optional equipment for models 202 and 201 arc welders.

HOW TO ENGINEER CORRUGATED SHIPPING BOXES
By Hinde & Dauch Paper Co., Sandusky, O. Handbook describes methods employed by company's package laboratory in construction and design of new types of corrugated boxes and in solution of general packaging problems.

BROACHING AND BROACHES
By Colonial Tool Co., Ltd., Windsor, Ontario, Canada. Seventy-six pages, combined manual and catalog, No. F-47, divided into four general sections, giving data and information of importance to the metalworking industry of Canada. Available only to Canadian metalworking industries.

HOW TO SELECT COATINGS FOR ALUMINUM
By Watson-Standard Co., Pittsburgh, Pa. An article dealing with aluminum castings, extrusions, forgings, sheets and foil, considers both functional and decorative coatings.

3/16-IN. PITCH SILENT CHAIN
By Link-Belt Co., 220 South Belmont avenue, Indianapolis 6, Ind. Book 2010, 16

pages, illustrated, lists applications of the chain drive for fractional horsepower drives, shows variety of drive arrangements and actual installations. Also contains dimensions of sprocket wheels, horsepower ratings and information on how to select chain drive, including calculation of chain drive centers and length of chain required.

PRESS-VEYOR CASE HISTORY
By Rapids-Standard Co. Inc., 342 Peoples National Bank Bldg., Grand Rapids 2, Mich. A single page, illustrated reprint telling material handling case history of Dodge Tool & Mfg. Co. and how Press-Veyor power belt conveyors have been installed in the firm's press room.

LIGHTING HANDBOOK
By Westinghouse Electric Corp., Lamp Division, Bloomfield, N. J. Revised authoritative reference work containing variety of technical data designed to aid illuminating engineers, utility lighting specialists, architects, contractors, etc. Available for \$2.

BESLY-TITAN ABRASIVE WHEELS
By Chas. H. Besly & Co., 118-124 North Clinton street, Chicago 6. A 48-page handbook explaining the advantages of Steelbac grinding disks, use of Resinoid bond, includes information on types of grain used in making wheels, porosity control and types and uses of coolants, standard marking system chart and price list tables.

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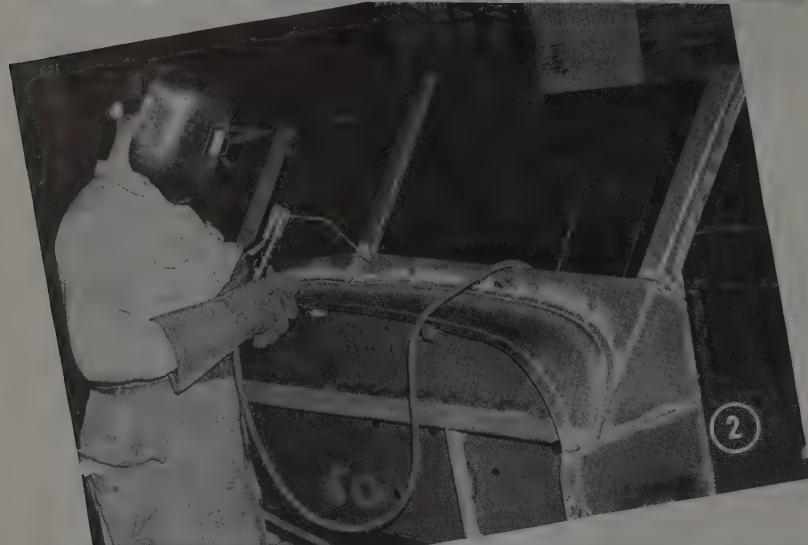
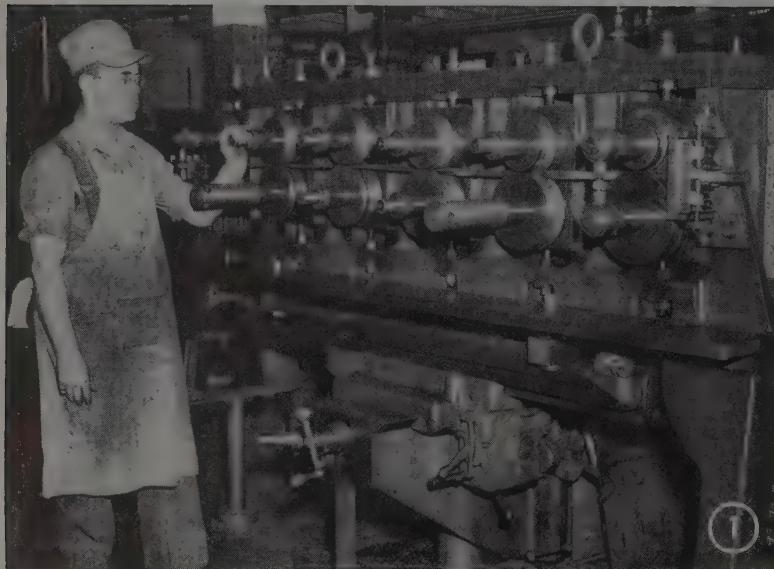
IN EVERY COMMERCIAL FORM



Specification Changes

... in fire fighting equipment met easily by arc welding

By R. H. DAVIES
Consulting Engineer
Lincoln Electric Co., Cleveland



BECAUSE of the variety of local conditions governing the demands placed on fire-fighting equipment, each piece of apparatus built at the Columbus Q. plant of Seagrave Corp. is designed on the basis of individual specification. Since the adoption of arc welding in the fabrication of fire trucks, the problem has been greatly simplified since welding reduces the amount of tooling required to make specification changes.

Apparatus intended for rural use, for example, must be equipped with water tanks of sufficient capacity to quench small farm fires when no other water supply is available. Its equipment must include units which enable the pumper to draw water from wells, ponds or open streams and deliver it under high pressure to hose lines.

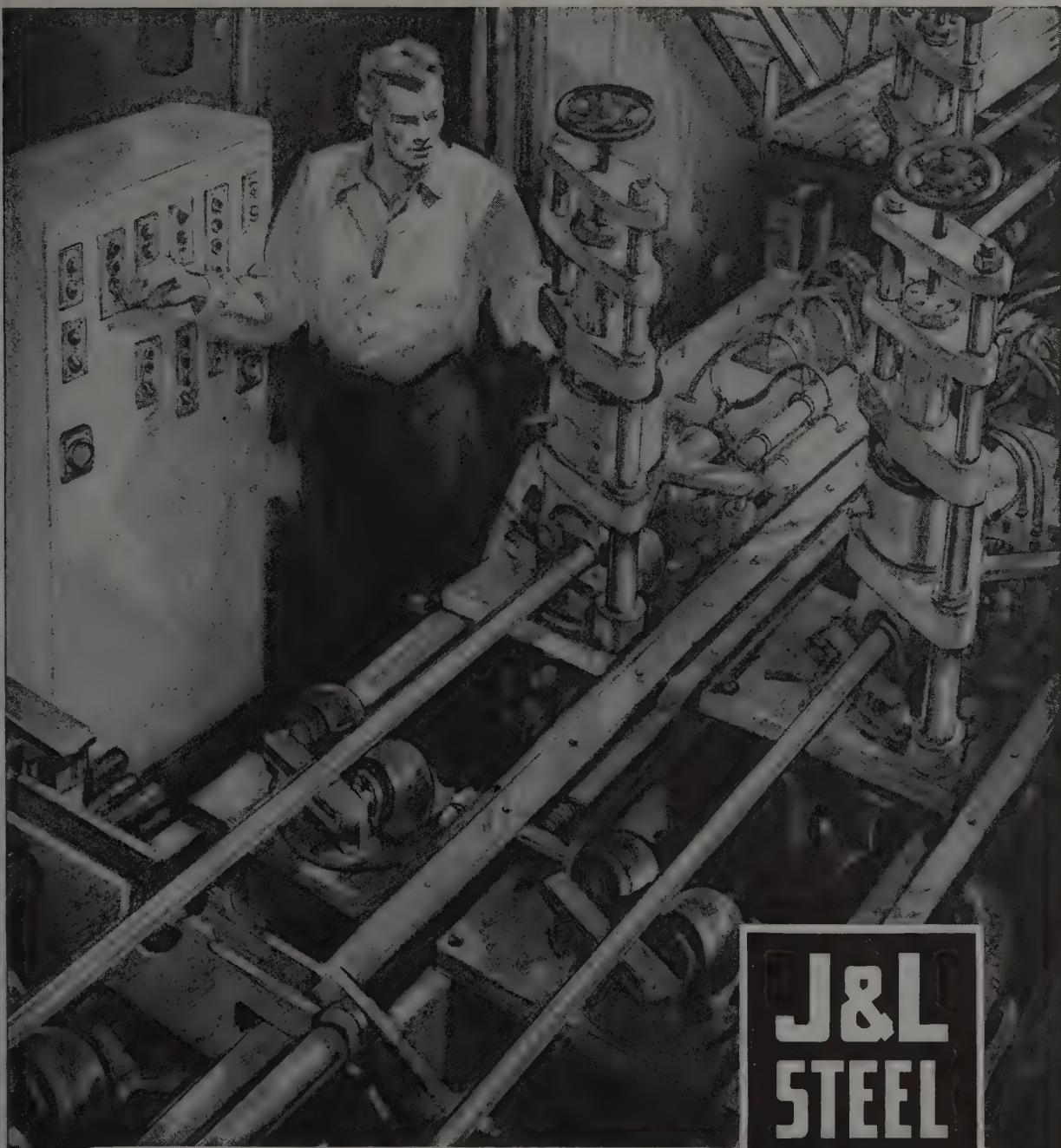
Equipment for city use generally carries a larger complement of ladders, salvage and rescue equipment, with emphasis on power—power to pump huge volumes of water at low pressure—power to deliver water at high pressure to conflagrations which cannot be approached by firemen—and power which under no circumstances will fail during a fire.

Close-grained bronze castings joined by arc welding form the housing for Seagrave centrifugal pumps, which are capable of delivering from 500 to 1,000 gal of water per minute at 150-lb pressure to hose lines. Cylinders of the hydraulic lifting mechanism, which elevates the big ladders on aerial trucks are fillet welded to join the cylinder to

Fig. 1 — Strip steel is passed through this homemade shaping machine and formed into a modified J-shape before it is welded in the hollow I-beam structure forming uprights of the Seagrave welded steel aerial ladders

Fig. 2—First stage in fabrication of fire truck bodies is construction of cowl assembly. Here operator is shown pointing up weld on center windshield support

Fig. 3—Deflection of only 5 1/8-in. resulted when 35 men, weighing a total of 5822 lb lined up on this completed section of an aerial ladder



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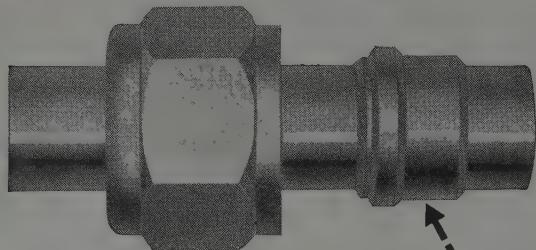
You can now gain the additional advantage of increased uniformity in your bar stock by using J&L "Electreat" Cold Finished steel. In this new electric induction heat treatment process each bar is heated and quenched individually in exactly the same length of time as other bars in the lot. This makes possible greater uniformity than is provided by conventionally heat treated bars. In addition,

"Electreat" bars retain their sectional accuracy and quality surface. Induction heating also keeps to a minimum decarburization of the bar.

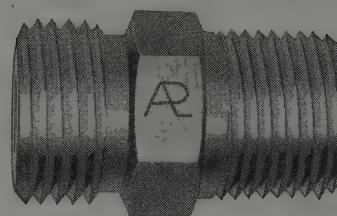
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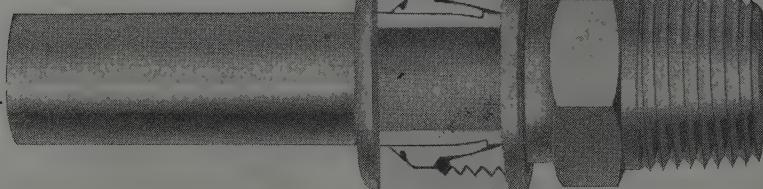
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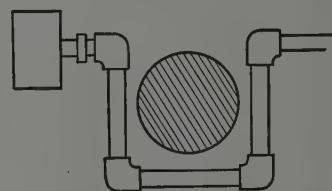
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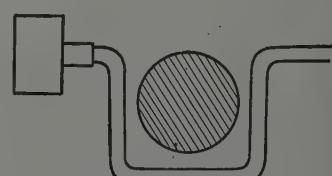
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FREE FLOW— a comparison

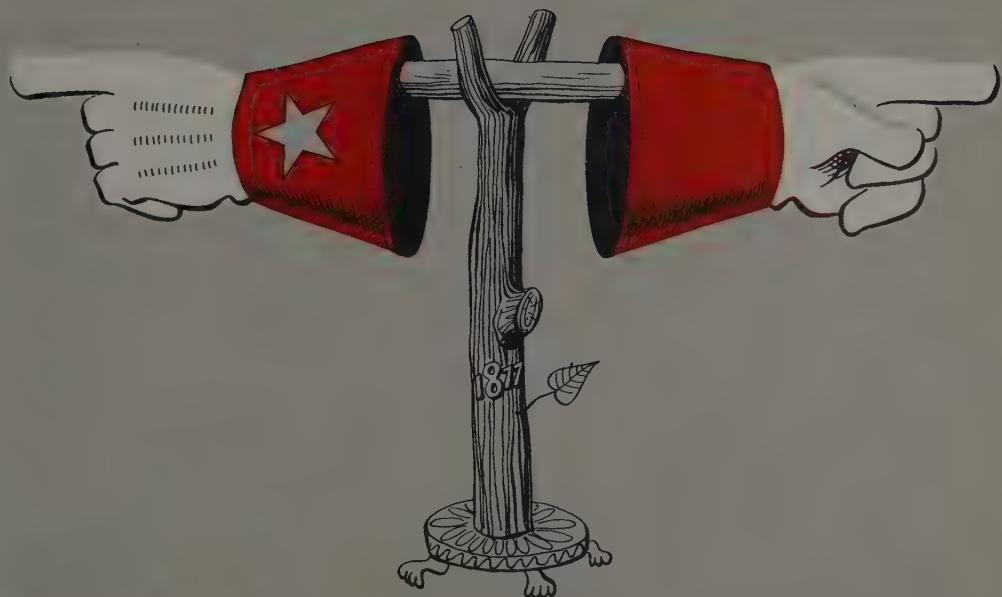


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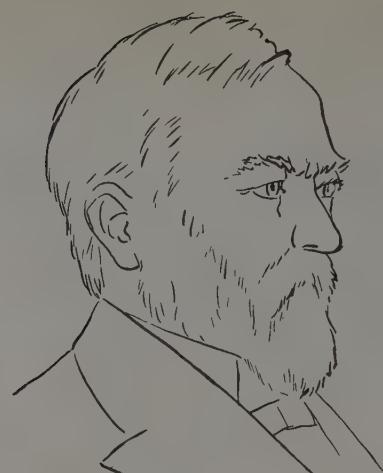
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Andrew Carnegie

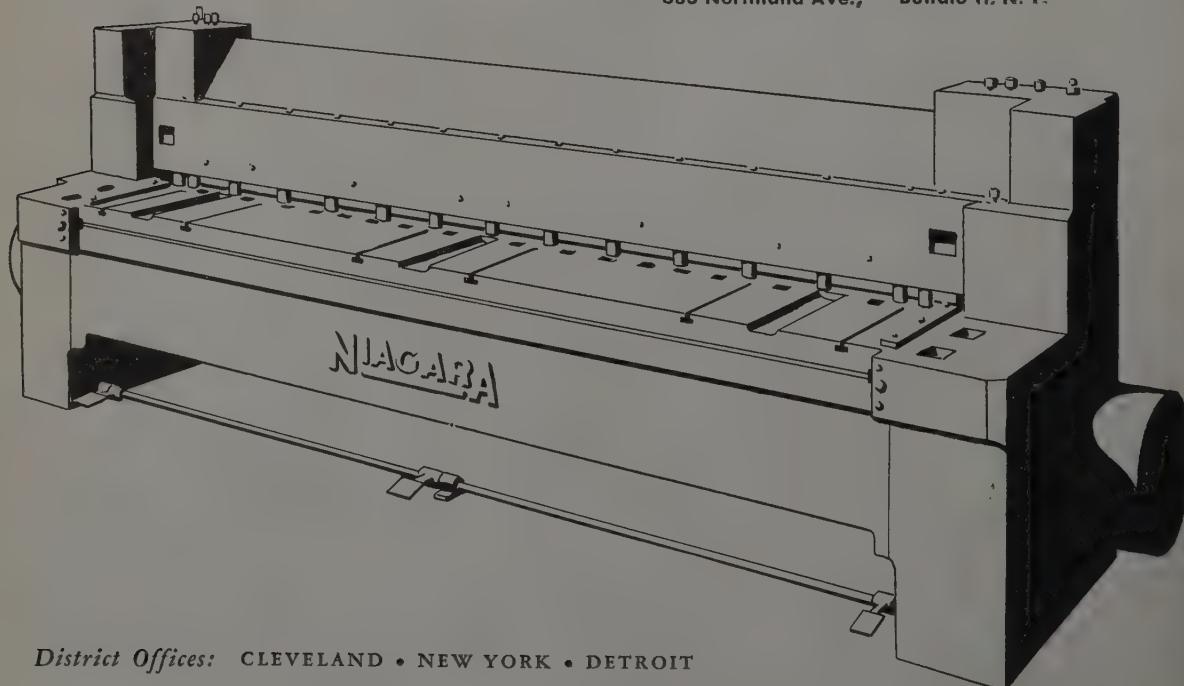
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the base permanently. Truck bodies and cabs are welded, Fig. 2.

A feather-light, strong, all-welded steel aerial ladder is the outstanding feature of the company's hook and ladder apparatus. In the fabrication of this ladder, strips of 16-gage steel, 2-1/8-in. wide, are run between a series of rollers in a home-made shaping machine, Fig. 1, which forms each strip into a cross-section resembling a "J" with a 1/2-in. lip at its lower end.

These strips are cut off in lengths varying between 24 ft and 40 ft, conforming to length of the ladder on which they will be used. Another strip of 16-gage steel, from 3-1/2-in. to 4-1/2-in. is run through a punch press which stamps rung holes at intervals of from 14 to 18-5/8-in. These rung holes are dented slightly by the punch press to give additional strength at points where rungs later will be welded.

An automatic spot welding machine is used to join two of the "J"-shaped strips with a flat strip in which rung holes have been punched, the welds being spaced at 1/2-in. intervals. Next, two of these members are set side by side in a rack which clamps them together while an operator runs a fillet weld their entire length. The operator then turns the joined members and runs a fillet weld down the opposite side.

Ladder uprights are placed on their sides in another rack, one above the other to a height equal to the length of the tubular steel rungs. Rungs, covered with a long-wearing corrugated rubber are then inserted and an operator runs a fillet weld, Fig. 4, around the rungs on the exposed inside of the bottom upright and outside of the top upright. The ladder is then turned over and the

operation repeated, thus completing the ladder, itself.

Ladder is then placed flat on saw-bucks where safety handrails, made from 1-1/2-in. square 0.140 wall steel tubing with a tensile strength of 70,000 psi are fabricated by fillet welding. In this phase, the operator welds short lengths of the square tubing in an upright position on the ladder uprights at intervals of 30 in. The handrail is then clamped atop the short lengths of square tubing and is welded at each joint.

Reinforcing lengths of square tubing, trimmed at the ends to fit into the 90-degree joints formed between the short lengths and the ladder upright on the one hand and the handrail on the other, are fitted diagonally across each of the quadrangles.

These diagonal lengths are joined by fillet electric welding, Fig. 5, at the handrail on the bottom end of each quadrangle and at the ladder upright side on the upper end of the quadrangle. This arrangement of members is designed to achieve transfer of part of the load from the ladder uprights and downward.

A complete section of the ladder is pictured in Fig. 3 which shows 35 men with a total weight of 5822 lb standing on the base section of an 85-ft steel aerial ladder. Maximum deflection of this load, with the ladder supported at both ends was 5/8-in.

Aerial ladders are made in lengths of 65, 75, 85 and 100 ft. Each has three ladder sections which telescope into one another in such a manner that the flange on the next lower section is used as a track on which self-lubricating rollers of the next section ride. Throughout the final welding process the ladder structure is relieved of stress by use of

Fig. 4—Operator running a fillet weld around rungs of ladder. Each rung is welded at four points—inside and outside upright on both sides

Fig. 5—After rungs are in, ladder is placed in flat position and handrail fabricated by fillet welding square tubing

Fig. 6—This German "nibbler" is capable of cutting straight, curved or irregular lines without leaving a frayed edge on material

an acetylene torch. Allowance for distortion of the completed ladder section is 1/16-in.

A graphic test of the strength of these aerial ladders was gained in an experiment conducted at Ohio State University's stadium. The ladder was extended 101 ft, 4 in. and its upper end rested against the stadium at a 70-degree angle. A total distributed load was established by hanging 90-lb weights on every third rung and a man weighing 180-lb stood in the middle. The total deflection caused by the entire load was 2-3/4-in.

Seagrave officials report 40 different types of welding operations in the fabrication of fire-fighting apparatus. Fabrication of cabs and bodies is almost completely a job for arc welding. A home-

(Please turn to Page 120)



101



6

PRESENT era in pressed-metal engineering is developing a wider use of automatic handling methods and more frequent combinations of stamping operations. Both automatic feeding and multiple-operation tooling require for success a sound understanding of metal-working theory and every careful attention to detail. Any of the typical operations can be put together in a suitable sequence to produce most parts in more or less finished form at one pass. The capacity of metal to stand the series of operations without intermediate annealing must always be checked. Economy of material is also important in choice of methods, as metal cost is necessarily a major item in the total cost.

Economies of automatic feeding of multiple-operation tools are principally in space saving, inventory reduction, simplified handling, improved production and safety. One press takes the place of a number of smaller ones, each with space for a tote box of parts to be worked and for another box to receive the worked parts. Additional space may be needed for storage of a quantity of parts awaiting the next operation. These same parts-in-process, waiting their turn from one machine to the next, represent a very substantial inventory item and a handling problem of some importance. Hand feeding at each press is ill-timed, nervously tiring and quite possibly hazardous.

In these days of constantly rising labor costs about the only way to keep the standard of living rising without increasing costs is to improve the rate of output for the same effort.

Highly Specialized Automatic Units

In this mass production industry of pressed metal working that becomes something of a trick. But in most cases, where the demand is substantial it can be done. The way was pointed before the war, and was emphasized during the war, by the highly specialized automatic units for cartridge cases, bullet jackets, bullet assembly, fuze cups, cartridge clips, machine gun links, etc.

This trend continues with the greatest volume of orders ever placed for automatic presses. This comment on automatic presses may seem a bit irrelevant to the original subject, but is it? If production warrants putting a combination, multiple or progressive die on the job, it is more than likely to warrant putting it in the best kind of a press with the most suitable feeding mechanism available. A properly designed press may increase tool life three or 400 per cent. A good, fast, automatic press may, similarly, increase production rates. The use of coil stock may cut scrap losses, handling costs and material costs by a much smaller but still worthwhile per cent.

Many of the greatest savings, however,

COMBINED STAMPING OPERATION

... one method of increasing output at same rate of effort

By E. V. CRANE

Vice President
Sam Tour & Co.
New York

are ordinarily made by combining operations in one of three ways: Combination tools; multiple tools and pressing operations. The initial handling of the material in strip, sheet or coil form is usually relatively fast and inexpensive as compared with the slower rate and higher costs of picking up, locating, laying down and intermediate storing of secondary operations. Combination tools in which operations are combined at a single station are quite widely known. Among them are: Blank and draw dies; blank, draw and pierce or stamp; draw and pinch trim; draw and redraw; blank, draw and curl; pierce and blank; pierce, part and bend; and hole and flange. All of these, and probably others, can be run automatically as well as manually. Such operations are quite likely to require or be favored by inclined operation of the press for gravity discharge of the work from the surface of the die.

Progressive operations are of two major types. One type is those run in multiple slide or eyelet type presses with transfer feed mechanisms which move entirely separated stampings from position to position. These admit of separate dies at each station and almost unlimited combination of operations. The cost of a finished set of tools tuned up and in operation may readily exceed twice the cost of hand fed tools to be used, in separate presses for the same parts. This is due in part to using more operations and more conservative operations, and in part to precise matching and development to favor feeding.

The other type is those progressive operations in which the part is held in the strip until it is finished. These have shown the most rapid increase in pop-

ularity and the greatest return when they are properly applied. They require rather careful planning to avoid interferences with feeding, proper pinning, proper tool strength and convenience of tool maintenance. They may readily cost 50 to 100 per cent more than a similar set of separate dies. Improperly planned or estimated, they prove a sorry surprise to the die maker. Once in proper operation, however, they are likely to be very large cost savings for the manufacturer.

Multiple dies are those in which a number of identical parts or paired parts are produced at each stroke of the press. They may include a plain blanking, combination operations or progressive operations. Ordinarily warranted only when production rates are exceptionally high, they necessarily increase both die making and maintenance problems, but also improve scrap economy and greatly increase output. They make it particularly important to pick a good and well-built press.

All of these more complex die and stamping problems are increasing the need for the sort of service the commercial metallurgical laboratories, with their specialized facilities and troubleshooting experience are rendering to the industry. Stress corrosion problems, seasonal cracking, fatigue cracking, lubrication, work hardening, pressure welding, die galling, material selection, finishing and many other problems are the routine leaks which such organizations are schooled in plugging.

Higher Burden Rate

Automatic presses should carry a higher burden rate than manually fed equipment. The difference should take into consideration differences in set-up time and in tool and press maintenance, being greater as the complexity and delicacy of the work increases. It is unfortunate that none of the automatic presses now available take full advantage of the possible conveniences that lessen set-up time.

To illustrate the economies of automatic progressive combinations of operations, assume a stamping in 16 gage 1010 steel, requiring three operations to complete it. The blanking operation is being hand-fed to a stop using strip material and catching about 100 surface feet per minute or 5000 per hour. The subsequent operations are hand-fed at about 15 or even 20 per minute, or about 1000 per hour. A rate of \$1.50 an hour for labor and labor burden, plus a rate of 50 cents per hour for machine rate and tool maintenance, etc., gives a total rate of \$2.00 per hour. Using this rate on three presses operating full time and the blanking presses 20 per cent of the time, gives a total for the piece of \$4.40 per thousand.

(Please turn to Page 120)

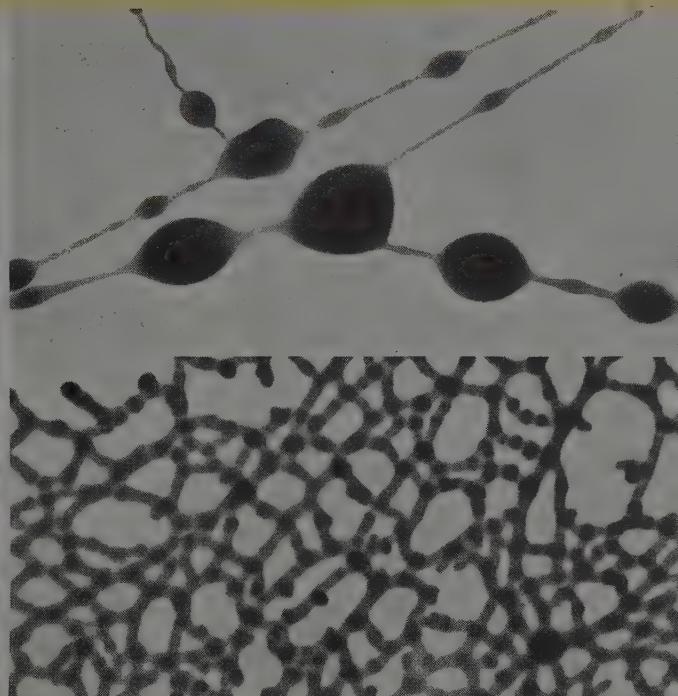


For detailed information

— on products and processes



cast iron from crane wheel magnified 2,000 times.



Above, fresh milled rubber. Below, after vulcanization.
Magnifications 100,000 times.

Courtesy Ind. Eng. Chem.

Turn to...

photomicrography
for magnifications up
to 2,000 times

electron micrography
for magnifications up
to 100,000 times

IN many production problems, the smaller the details you can see, the more you realize their importance. It's the detail seen in a photomicrograph or an electron micrograph that often explains why some materials do their job and others don't.

Photomicrography with optical equipment reaches its useful magnification limit at about 2,000 diameters. Photographic plates from electron microscopes yield detailed information by enlargement up to 100,000 times actual size.

The problem is not whether optical or elec-

tronic magnification is better, but which is more suited to your particular requirements. Vital to the application of both in industry is photography...with its endless capacity for details...its way of making a point for all to see and be convinced.

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A Boon to Castings Practice:

Single Slag Basic Electric Heats

By M. V. HEALEY
Works Laboratory
General Electric Co.
Schenectady, N. Y.

Process essentially consists of an adequate boil for the purpose of eliminating the neutral and reducing gases and then tapping the heat before the gases have an opportunity to return. Grain growth characteristics approaching those of basic open-hearth steel are imparted

COMPARISON of microstructures of samples from molybdenum alloy sand castings of basic open-hearth and double-slag basic electric steels, shows the former possess a certain characteristic that is not present in the latter. This characteristic is the ability, in the absence of inhibiting alloys, to grow a relatively large grain in heat treatment.

It has been established that if a single oxidizing slag process is substituted for the double-slag process in the basic electric furnace, it is possible to obtain a product approaching basic open-hearth steel in grain growth characteristics.

With the difference between basic open-hearth and double-slag basic electric steels in mind, a single oxidizing slag process has been developed at General Electric for the production of molybdenum alloy steel castings. The process may be used to advantage in the production of carbon steel castings.

Figs. 1 to 3 are photomicrographs of samples of basic open-hearth, double-slag basic electric, and single oxidizing slag basic electric steels. These steels were made without addition of aluminum or other known inhibiting elements. The samples were taken from coupons attached to medium to large size castings. The analyses in all cases were similar, a typical analysis being as follows:

	Per	Per
	Cent	Cent
Carbon	0.20	Molybdenum 1.10
Manganese	0.70	Sulphur . . . 0.015
Silicon	0.40	Phosphorus . 0.018

Fig. 1—Basic open-hearth molybdenum alloy cast steel. Heat treated at 1922° F. Etched with 2 per cent Nital. X100

Fig. 2—Basic electric molybdenum alloy cast steel produced by double-slag process, 60-minute boil. Heat treated at 1922° F. Etched with 2 per cent Nital X100

Fig. 3—Basic electric molybdenum alloy cast steel produced by single-slag process, 60-minute boil. Heat treated at 1922° F. Etched with 2 per cent Nital. X100

The three samples were heat treated in a small laboratory furnace. The cycle applied consisted of a hold at 1050° C (1922° F) for 6 hours, followed by a furnace cool at the rate of approximately 500° C (900° F) per hour.

Reluctance of the double-slag basic electric steel to attain a grain size comparable with that of the other steels can not be charged to any ordinary alloying element since the same ferroalloys were used in the preparation of all three.

Essential difference between the methods by which the three steels were produced appears to be that, in the double-slag basic electric process, a reducing period of approximately 1 hour's duration was applied after the end of the boil, whereas in the other processes, the metal was removed from the furnace shortly after the end of the boil.

The single oxidizing slag process was developed for basic electric steelmaking when it became evident that the double-slag process was inadequate for the production of steel of the desired grain growth characteristics. The development was influenced by several considerations and assumptions.

Difference between basic open-hearth and double-slag basic electric steels cannot be attributed to inhibitors that are measurable by the ordinary chemical analysis.

Inhibition displayed by double-slag basic electric steel could be due to neutral or reducing gases either residual in the bath or reabsorbed after the end of the boil. Of these gases, nitrogen is the most likely suspect. It has been used on occasion to impart a fine grained structure to steel. Furthermore, there is considerable likelihood of nitrogen absorption during the reducing period of the process.

Boiling should be sufficient to eliminate neutral and reducing gases to a satisfactory degree. Certain steels probably need more complete elimination than others. Until it is possible to measure accurately the gas concentrations in molten steel, this must of necessity be a trial and error procedure.

Since gas elimination ceases at the end of the boil, and since reabsorption can



GIANT or DWARF



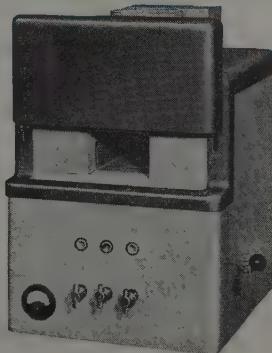
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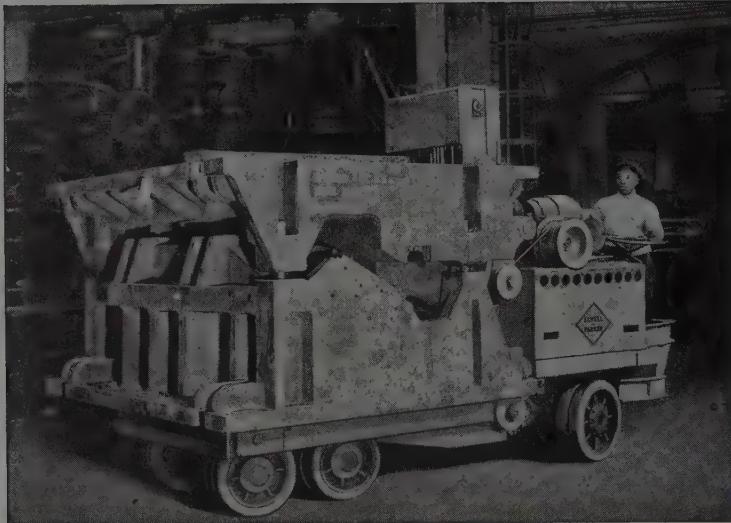
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EXTRA RUGGED FRAMES— They have the true ring of one solid piece because they are durably welded and riveted into a unit of heavy gauge plate by Elwell-Parker craftsmen.

STRONGER MOTORS— They are E-P built, Class B type, practically indestructible and fire proof. Because these motors have more copper, greater commutator area, plus more brushes than usual, they easily absorb all the power that can be delivered to them.

UNIQUE ENGINEERING— Because Elwell-Parker engineers have had longer experience, they fully recognize the abuse and overload factor. Consequently, you find *surplus* strength wherever needed; for example: double stabilizing tilt racks; overload slip clutches, no fuses, and a new, high-speed travel controller.

For further evidence regarding the strength of these trucks, plus their proper application to your specific needs, call in the nearest  man. The Elwell-Parker Electric Co., 4501 St. Clair Avenue, Cleveland 14, Ohio.

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begin immediately, the reducing period of the double-slag basic process offers an opportunity for increasing the gas content of the metal.

The reducing period, save for instances where it is desirable to recover oxidized alloys from the slag, performs no useful function in steelmaking. Some cost reduction can be accomplished by its elimination. If the reducing period were eliminated, the resultant process can be made similar to the basic open-hearth process.

The basic electric process devised consists essentially of removing neutral and reducing gases by an adequate boil and then taking the metal from the furnace before these gases have an opportunity to return.

Definition of an adequate boil is not feasible until it is possible to determine the gas content of the molten metal. There has been some indication that a boil approaching an hour's duration is necessary for steels that must have good grain growth characteristics. Possibly the type of boil has a bearing on the results obtained.

It has been found advisable to "catch the carbon on the way down." That is to say, the end point of boiling should be the time when the carbon concentration in the bath reaches the value desired in the product.

In the process to date, the manganese addition is made to the furnace about 3 to 4 minutes after the boil has been blocked with 0.15 to 0.20 per cent silicon. The final silicon addition is made to the ladle.

Since the end of the boil generally finds the temperature of the metal somewhat lower than is desired, the period allowed for solution of the manganese addition—5 to 7 minutes—is being used for temperature adjustment. Applying current after the end of the boil admittedly is against interest if nitrogen is absorbed from the arc.

A paper on this subject was presented by the author at this year's annual meeting of the American Foundrymen's Association, Detroit.

Specimen Welds Measure Welded Joint Toughness

Determining the toughness of welded joints in steel structures by measuring the load-carrying ability of specimen welds is proposed in a research report offered by Office of Technical Services, Department of Commerce, Washington. It is intended that tests of specimens including welded joints should be compared with test results of similar specimens of unwelded metal, the tension side of the welded specimen representing the irregular surface of the weld.

In this way, the report states, the toughness or ability of the welded member to adjust its shape to withstand the

Article Prize Contest

AN article contest, with awards amounting to \$1500, is to be sponsored by the Industrial Furnace Manufacturers Association, New York, in order to encourage the publication of more and better technical discussions describing the economic advantages obtained from the use of modern industrial furnaces, kilns and ovens. Cash awards are to be made to authors of the best three stories appearing in the technical press in accordance with the following rules:

1. Eligible articles must be published between Oct. 1, 1947, and Sept. 30, 1948, inclusive.
2. Articles must be original. Technical society papers subsequently published in a trade paper will be considered.
3. Articles may be purely technical or semitechnical, but must describe specific advantages obtained by the use of modern industrial furnaces, kilns, or ovens used for heat treating, processing, or melting.
4. Equipment or processes described must be commercially operative and of benefit to users of the industry's products.
5. Competition is open to all except those connected with the industrial furnace, kiln, and oven industry.
6. Papers shall be judged for:
 - (a) Completeness and accuracy of operating data such as fuel or electricity cost, labor costs, floor space requirements, savings in preceding or subsequent operations, material costs, etc.
 - (b) Concise and complete coverage of improvements in the product, such as physical qualities, appearance, the reduction of rejects or rework, etc.
 - (c) Clearness and completeness of description of equipment including size, construction, operating cycle, etc.
 - (d) Uniqueness of design with regard to method of operation, material handling, heating, etc.
 - (e) Completeness of description of parts treated, size, material, rate of production, etc.
 - (f) In general, the ability for a possible user in the same or similar industry to apply these data to his product or operations, and to determine the possible advantages from his use of the equipment or process.
7. The following prizes will be awarded to the authors of the three best articles: First prize, \$1000; second prize, \$300; third prize \$200. Awards of merit will be given to the publishers of the three winning articles.
8. Judges shall be appointed by IFMA, and announced before Dec. 31st, 1948. They shall not be connected with the industrial furnace, kiln, and oven industry or with any trade paper.
9. Awards will be made and checks sent to the authors of the three best articles on or before Feb. 1, 1949.
10. Decisions of the judges shall be final.

Readers of STEEL interested in participating in the contest may submit their articles to the Editor, STEEL, 1213 West Third Street, Cleveland 13, O. STEEL will pay for original articles meeting the above requirements and accepted for publication in STEEL, whether or not they win IFMA prizes.

load can be evaluated, just as the toughness of unwelded steel is measured by applying a load on a bar that contains a small notch.

Results of a series of bend tests on steel heat treated to approximately equal strength but to different levels of toughness and with various kinds of notching are given. Tests were made at 70° above and 40° below zero F. The report, PB-49082, covers results of preliminary tests in a program of evaluating mechanical effects in welded joints and structures.

Capacitor Available

An air-dielectric variable capacitor with a range of 30-1 between minimum and maximum capacitance is available from North American Phillips Co. Inc., 100 East 42nd street, New York 17. The condenser is designed for use in industrial electronic applications and is resistant to mechanical shock.

The condenser of this unit has a flash rating of 500 v and capacitance is adjustable from 5 to 150 mmf by rotation through 5000 degrees.

ACCURATE PRODUCTION CONTROL

In Direct-Current Arc Welding

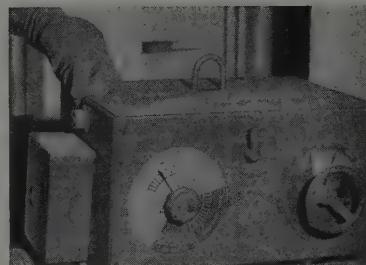
INDUSTRIAL operations other than welding employ all manner of production control methods, ranging from counters which register the number of operations of a punch press to indicators which automatically log the runs and stops of trucks and busses.

Heretofore, welding has had two problems: Maintaining production control records only through the unsatisfactory method of recording lineal footage of welding done or by weight of welding rod deposited; finding a means of preventing needless wear on equipment and waste of electric power on welding operations which, even when highly efficient, are intermittent.

Answers to these problems are supplied by DV Welding Controls, Oakland, Calif., in their recently developed arc time totalizer and automatic start-stop control, both of which are contained in a single case that is mounted on the welding set.

Arc Time Totalizer: This instrument provides a basis for production control of hand welding operations, the total accumulated arc time being registered directly in minutes. It operates only while a normal welding arc is maintained, registering only useful welding or arc time, not welding machine running time. The meter will stop if the welding rod sticks to the work, is otherwise grounded or the instant welding is discontinued in the normal manner.

Specific uses to which arc time data derived from the instrument can be put are as varied as the welding operations themselves. Until a considerable body of data has been gathered through their general use, no uniform industry-wide standards for arc time can be established. Ignoring this fact, the fundamental purpose of the arc time totalizer is to provide management with accurate and complete knowledge as a prerequisite to the application of



intelligent planning and supervision.

Ways in which improvements in efficiency can be made usually become apparent only after totalizers have been in use for periods ranging from a few months to two years or more. Analysis of costs and elimination of factors tending to depress the quantity output or rate of welding production also come in for their share of benefit from the availability of arc time data.

Typical examples of arc time records tabulated in the accompanying table indicate the wide variation encountered. Variations result not only from differences in the nature of the welding work, but also from previously unrecognized differences in the methods of operation of plants during identical fabricating work. **Start-Stop Control:** With arc time averaging at the most about 35 per cent in a few plants, and for industry as a whole about 20 per cent, the opportunity for reducing the running time of the ordinary direct current welding set by shutting it off when it is not needed for welding is apparent. It has been found unfeasible to eliminate the full 80 per cent of the idle running time, since this would require starting and stopping the set each time the arc is established and broken.

By allowing the set to run for about 1 to 2 min after welding has stopped, the number of automatic start-stops is

usually reduced to about 15 per 8 hour shift, it is reported. Since the welding set is driven by a brushless induction motor (the brushes are on the direct current generator) there is no measurable wear connected with starting the set. The magnetic starter does get a little more usage than otherwise, but it is designed for much heavier service since it is never required by the action of the automatic control to shut off the welding set under load.

As computed by the developer of these instruments, the amount of electric power used in starting the welding set is about equal to the amount consumed during 10 sec of running idle. Thus all but about 150 sec per day of the shutdown time represents a net saving in electric power.

Amount of running time, expressed in per cent of total working time, which was eliminated by action of the automatic start-stop control in plants in which accurate measurements were made is shown in the accompanying tabulation. The controls were adjusted for a time delay between cessation of welding and shutdown of the welding set of 2 min. Reduction in wear on the equipment is roughly proportional to the reduction in running time, since the factors contributing to wear and deterioration are almost entirely absent when the equipment is not running.

Reduction in electric power consumption and load (or overload) on the distribution system can be determined accurately only by taking into consideration the particular conditions in the plant, it is said.

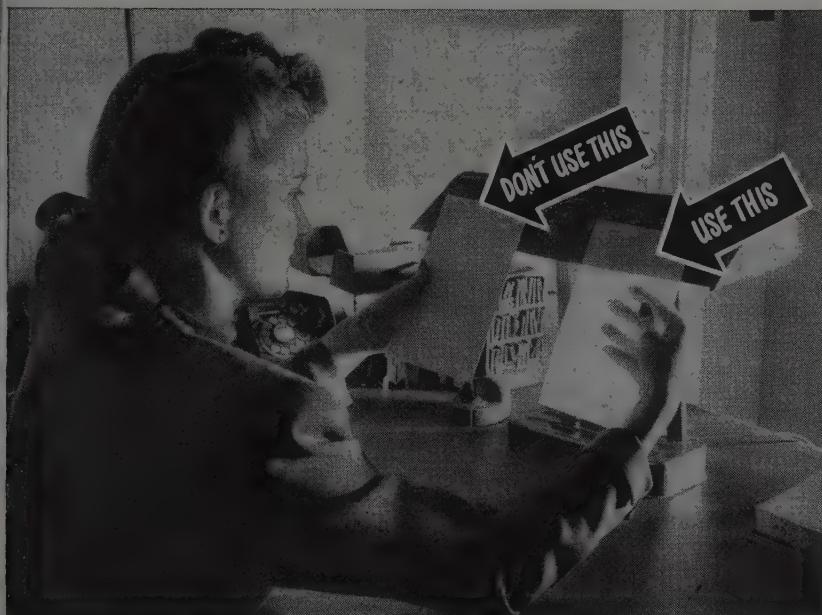
Varying conditions and requirements found among plants and shops often result in the discovery of unexpected benefits from the use of automatic start-stop controls, the company states. For instance, a considerable reduction in the noise level resulting from the reduced number of welding sets in operation at any one time is found to be desirable. In other shops the reduction in ambient temperatures in equipment rooms filled with welding sets has removed troublesome conditions.

Where frequent changes in the amperage and voltage adjuster settings on the welding sets are not necessary the use of these controls permits remote location of the sets. The operator never has to leave his work to stop or start his set.

Type of Work	Size of Plant	Number of Machines	Arc Time	Time Delay Setting	Reduction in Running Time
Mfg. of mining machy, lifts, buckets, etc.	Medium	8	16%	2 min	40%
Steel tanks	Large	75	24%	2 min	47%
Steel tanks	Medium	50	25%	2 min	23%
Steel tanks	Large	50	24%	2 min	32%
Mfg. of conveyors and special indust. machy	Large	15	29%	2 min	34%
Mfg. of large truck trailers	Medium	10	31%	2 min	20%
Mfg. of oil well machy	Medium	11	9%	2 min	39%
Mfg. of road bldg. machinery	Large	150	36%	2 min	31%
Mfg. of industrial cleaning machinery	Medium	25	19%	2 min	51%

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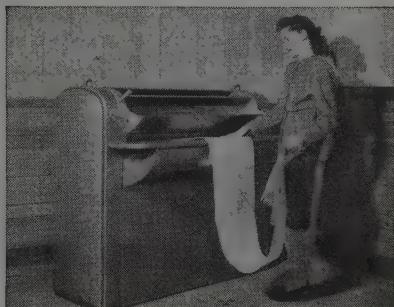
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The operation is unbelievably simple—place your translucent originals on Ozalid sensitized material, feed into the machine, and in 25 seconds you have completely dry, positive copies.

And note: There are 16 different types of Ozalid material! Color code your work by reproducing it in black, blue, red, sepia—on white or tinted paper—or on a base of cloth, foil, film, or plastic.

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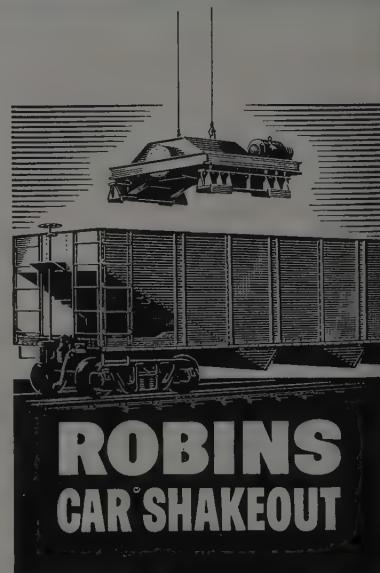
Fifty- or seventy-ton cars are emptied "broom-clean" in as little as 90 seconds. There is no damage to cars. The operator works in complete safety. Hours of labor are saved. Demurrage charges are practically eliminated!

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ROBINS CONVEYORS DIVISION, Hewitt-Robins Incorporated, Passaic, N. J.



Visual Scheduling System

(Continued from Page 79)

partments had complete sets of orders and change notices, and so they were in position to do the effective scheduling from them rather than being compelled to work from the detailed schedule provided by the production department.

The cost department was furnished reports from the recording department. These were on size 11 x 17 in. forms and contained the same information as was posted by the production department to its flow of material records. The cost department used these forms as posting media. It posted only on the day turn, and so its record could not be used by the production department for scheduling.

Although this had weaknesses which did not allow as good service to customers or as efficient utilization of personnel and plant capacity as we felt we should have, it was the system that enabled us to produce the steel for the millions of Timken tapered roller bearings. In essence, it is not too different from the methods used in most steel mills for the scheduling of finished operations.

Nevertheless, we felt that we could do better. The focus of an improved plan would have to be the use of a unit control that dealt with a single operation and a single order only, instead of a multiple control such as we had been using to schedule a whole order or a whole day of a department. The starting point, however, obviously had to be a better order for scheduling purposes. We were able to devise 8½ x 11 in. forms that combine the sales orders and mill schedule form and meets the need of the Gambrinus production department for a better scheduling tool. This new form is used in a way that goes far to eliminate the change orders which were so numerous and so confusing under the old plan. This is partly a matter of holding orders until material is about to be released and partly a result of different routing and record processing.

Clerical personnel scheduling finishing operations in the operating departments at Gambrinus was transferred to the production department. This change centralized responsibility where it belonged and made possible better control of the flow of material. The production department receives three copies of the orders processed at the plant, and the inspection department gets one. The operating departments no longer have to deal with bulky copies of all orders which contain a vast amount of information of no interest to them.

One copy of the order is prepared on card stock. This is the master order card. The obverse gives the order and delivery

specifications and routing with all necessary supplementary instruction. The reverse is the process routing record to which postings of stock in process by bales are made.

Two copies are dittoed and sent to the Gambrinus mill cold draw and annealing departments where they are checked for process routing. If changes in routing are made, they are noted and cleared through the process routing department at Canton, so that subsequent orders will be correctly routed. One copy is returned to create a numerical cross-index, while the master card is filed by customer name.

A schedule card, Fig. 3, showing operations, is prepared for use in estimating process time and designating the equipment on which work is to be done.

We use two 100-pocket Remington-Rand Sched-U-Graph boards, shown in Fig. 2. Each pocket represents thirty-one 24-hour days of one machine. One board represents the current and the other the following month. The process time estimator cuts Sched-U-Graph machine loading cards, Fig. 1, to indicate the allowed time for the operation. These cards are then tucked into the Kardex pockets to allocate machine time to specific operations on individual orders.

Each card in place blocks off specific hours of machine time. It is impossible to schedule two or more jobs simultaneously on the same machine, and so capacity is not over-sold. If we find that

an order cannot be handled in time to keep a delivery promise, because all available capacity is already scheduled, this information is relayed to the sales department. The delivery is then rescheduled to the best possible time and the revised delivery date noted on the master order card.

Scheduling orders to the operating departments is done from the Sched-U-Graph board. The date that an operation is to be done is stamped on the machine load and the schedule card—the latter being sent to the operating department.

The recording section notes work completed on the schedule and the machine load card is pulled from the Sched-U-Graph pocket. The machine loading card for each successive operation is clipped on the upper right hand corner when the preceding operation is completed to indicate that the stock in process has been moved to the next scheduled operation.

Finishing department schedule cards are not sent to the department until the stock has been moved to it. Work and schedules move together, instead of schedule cards getting way ahead of material, as was the case when each department got a copy of each order which it would eventually process. There is no confusion or uncertainty about what material will be available for processing or which orders will be run on which machines during specific shifts and dates. The visual control in the production de-

CONTINUOUS INFRARED DRYING: Fifteen 250 w reflector infrared heat lamps above and the same number below this paint rack dry the finish paint coat on these Ignitron rectifiers in 10 min. Installed in the Westinghouse electronic tube plant in Bloomfield, N. J., this drying method permits a continuous operation of spraying, hanging and removing which was impractical with the previous system





THWARTS ACID: Utilizing a $\frac{1}{4}$ -in. inner cover of specially developed fibrous material to guard the steel core from contact with acid, Goodyear Tire & Rubber Co., Akron, recently developed a new roll for steel mill pickling lines. Bonded to the steel core by a special process, the fibrous material is in turn bonded to the roll's synthetic rubber surface. In the accompanying photograph, of old type hold-down roll note how acid which seeped through gashed rubber cover severed the steel core. Cross-sectional closeup, reveals: A—steel core, B—fibrous inner cover, C—test cuts inflicted on outer rubber surface failed to pierce secondary fibrous cover

partment eliminates all confusion and uncertainty.

If, for any reason, an operation is not completed during the shifts for which it was scheduled, the card remains in the pocket after the time has elapsed. This, in itself, is a warning that rescheduling is essential, and indicates that a delivery promise is in danger of being broken. Rescheduling is not difficult for it is only a matter of shifting unit machine loading cards to available time. Visible control has vastly simplified scheduling of finishing operations.

Benefits of Method: In conjunction with the simplification of authority and responsibility in the production control department, this method of scheduling of machine loads has produced the following benefits:

1. We have been able to increase the percentage of orders shipped complete and on time to more than 80 per cent. Since some orders are too large to be shipped at one time under any circumstances and there is a percentage of pick up orders, this is better performance than it seems on the surface.

2. By shipping a high proportion of orders complete and on time, we have aided the sales department in improving customer relations, by giving it good delivery service and thereby reducing customer delivery inquiries.

3. By processing orders completely at each operation, operating departments are able to save considerable money on the cost of tool changes and setups; tonnage processed has been increased by improving the proportion of productive to total hours.

4. Lost bales are a thing of the past. Our in-process inventory as of May 31, 1946 varied less than 3 tons from our inventory record for the entire mill. This is a negligible variation.

5. Scrap loss and waste have been reduced. Formerly, small amounts of steel remaining after orders had been completed were scrapped. Now we can control processing of orders so that entire order is completed at one time.

6. Elimination of needless duplications of postings in the cost and production departments enabled us to release three girls for productive work.

7. Transfers of clerks from the operating departments to the production departments and the elimination of needless complicated postings of operating departments records have produced considerable clerical savings and released clerks for constructive work.

8. The unification of the production department by this grouping of operating and production department personnel has produced a stronger and more smoothly functioning scheduling section.

9. Machine loadings ahead of all operating departments are quickly determined by visual inspection of visible Sched-U-Graph pockets; it is practical to make schedules weekly in advance for the information of the operating departments. These are used to determine work schedules.

10. Miscellaneous savings of many kinds have been realized—in time, in costs, in personnel, in material—not only in the operating departments, the cost department, and the production department, but also in the sales department.

Everything considered, the introduction of the new scheduling system and the general improvement in production control that came with it have led to a general tightening up in the finishing departments' administrative methods. The elimination of the loss of steel which was cited is perhaps the most spectacular consequence to people not in the steel industry, since the idea of losing tons of steel seems fantastic, but it is far less important than the improvement in service to customers who look to Timken Roller Bearing Co. for steel.

Report on Stress Corrosion Resistance Available

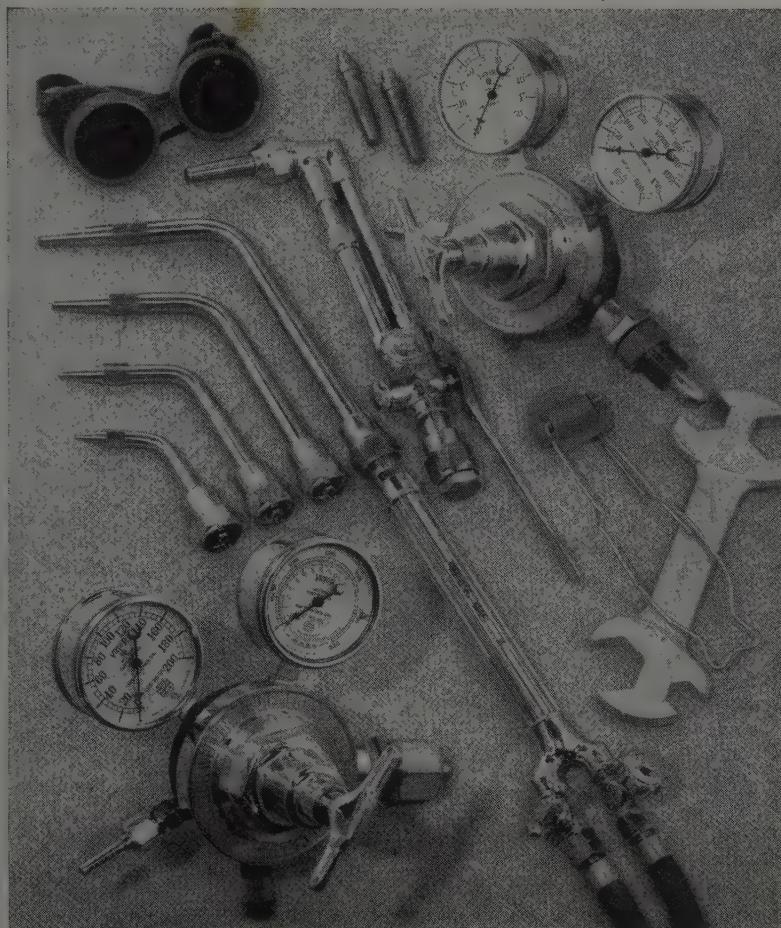
Resistance of aircraft structural materials to spontaneous cracking while exposed to the atmosphere under stress may be estimated more quickly on the basis of two new criteria developed by U. S. Army Air Forces and detailed in a research report offered by Office of Technical Services, Department of Commerce, Washington.

First of two parts of report is an early progress report dealing mainly with the methods used to expose and stress three types of test specimens. Part II describes the development and application of new standards for measuring stress corrosion resistance.

The two parts of the reports may be purchased separately. They are designated as PB-1426, Investigation of Stress Corrosion: Part I, Test Methods and Progress; and PB-55844, Investigation of Stress Corrosion: Part II, Results of Tests and Conclusions, Including a Method of Evaluating Stress Corrosion Sensitivity.

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on the construction job, particularly, a good gas welding and flame cutting outfit is a necessity. on a construction job, however, such an outfit is used largely for emergency repair, for hard facing, for silver brazing and for flame cutting—such an outfit, therefore, must be dependable . . . on the job when needed. and—that quality is one of the numerous reasons why victor welding and cutting equipment is today the most popular and one of the most highly regarded in industry.

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Stabilizing and Stress Relief

(Continued from Page 88)

columbium or titanium and dispersed within the austenite grain.

Further considerations are being given to the possibility of carbon absorption during the service life of exhaust manifolds. Photomicrographs, Fig. 5, show the cross section of the body on a manifold which had been in service for 100 hours. It is quite apparent that there is a relationship between the time in service and the type and distribution of carbides, dependent upon the service conditions. In connection with this, we have found that sections taken from the manifolds which have been in service and subjected to the copper-sulphate-sulphuric acid solution show up to 20 per cent greater loss in thickness due to corrosion by the electrolytes after 48 hours than will be obtained under service conditions up to 4000 hours, Fig. 6.

It is from these tests that we conclude that there is no correlation between the required accelerated corrosion tests as outlined by specification and actual service conditions. Some type of corrosive test is necessary to determine the susceptibility of the various grades of stainless steel to carbon precipitation, but it does not necessarily follow that these materials should fail after being tested in strong electrolytes they will not give excellent service under operating conditions. Such tests are of little value if they cannot be correlated with conditions of service.

It is interesting to note that the wealth of material gleaned from service reports over a period of years at the Ryan plant shows conclusively that there are two major types of manifold failures: One is due to fatigue failure which occurs in an open area subjected to strong pulsating forces—particularly in relatively flat areas. The other type of failure is encountered when severe stress raises are present in a critical area and are

typified by the base of hangers, the edge of double plates, or bolt holes. Both of these types may be rectified by change in design.

At various times the laboratory has been called upon to analyze material in the areas of failure to determine if the condition of the material is at fault. As yet, we have been unable to show that excessive carbide precipitation or intergranular corrosion, or a combination, of both, has any effect upon service failure which could be attributed to the conditions of electrolytic corrosion.

Following tests were run on columbium and titanium-stabilized material for the purpose of determining the effect of carbide distribution on corrosion resistance. For consistency of purpose, all tests in each group (columbium or titanium-stabilized) were run on the same heat of material. The specimens were processed in the following manner:

(1) Gas and arc weld samples were heat treated for various times at different temperatures. Half of the samples were sensitized.

(2) One production part was sectioned which contained both gas and arc welding. Samples were taken and processed in similar manner to the above.

(3) All samples of both the sensitized and unsensitized types were immersed in the copper-sulphate-sulphuric acid solution (Strauss tested). The period of immersion was 48 hours.

(4) All samples were cross-sectioned for microscopic examination.

(5) Carbon and stabilizing element ratios were obtained on the materials tests and are as follows:

Titanium	Columbium
Stabilized	Stabilized
Carbon ... 0.078%	Carbon ... 0.07%
Titanium ... 0.376%	Columbium ... 0.88%

As represented by photomicrograph, Fig. 7, all of the arc welds proved to be satisfactory in resistance to carbide precipitation and intergranular corrosion. Therefore, it appears that there is no

need for post welding heat treatment of arc welds for any reason associated with carbide precipitation.

Gas weld of type 347 (columbium-stabilized) shows better resistance to corrosive attack by electrolytes than that of type 321 (titanium-stabilized) in Fig. 8. These were treated for 2 to 3 minutes at 1650° F for stress relief. It might be well to explain here that Ryan Aeronautical Co. uses titanium-stabilized grade of 18-8 for manifold use only when the columbium grade is not available, and consequently we have insufficient actual service data to show relative service results. However, other manufacturers of exhaust manifolds use titanium-stabilized steel almost exclusively and do not employ the stabilizing heat treatment for their products. Therefore, for the purposes of comparison, both grades are treated in this article as having the same end result in exhaust manifold use.

Bend tests on the weld zone after embrittlement tests required in specification AN-QQ-S-757 proved to be more satisfactory than was expected. All but one sample, which cracked during preparation, withstood bending 180 degrees over a diameter equal to twice the thickness of the material, which was 0.043-inch. Compression failures on the inside of the bend radius were noted in all specimens.

Results of the tests have been crystallized into a conclusion that has an important bearing upon the serviceability tests for stainless steels and indicates that more research is needed in this field. This conclusion is that stabilizing treatment obtained by heating welded sections of 18-8 types 321 and 347 stainless steel for 30 minutes at 1650°F. exerts some small, but inconclusively beneficial results in one respect of minor significance—resistance to attack by corrosive aqueous solutions and electrolytes. There appears to be no justification for assuming that any substantial and practical benefit will be obtained by applying this



FIFTH WHEEL: This special type tractor recently installed in the various plants of Fruehauf Trailer Co., was built by Baker Industrial Truck division of Baker-Raulang Co., Cleveland, to haul trailers from place to place after they leave the assembly line. Fifth wheel coupler which engages the trailer is mounted on an elevating platform, permitting front end of trailer to be lifted to facilitate moving

A HABIT TO JOE...

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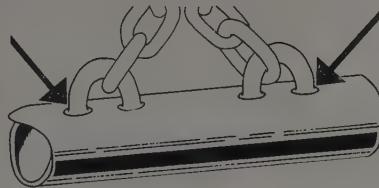
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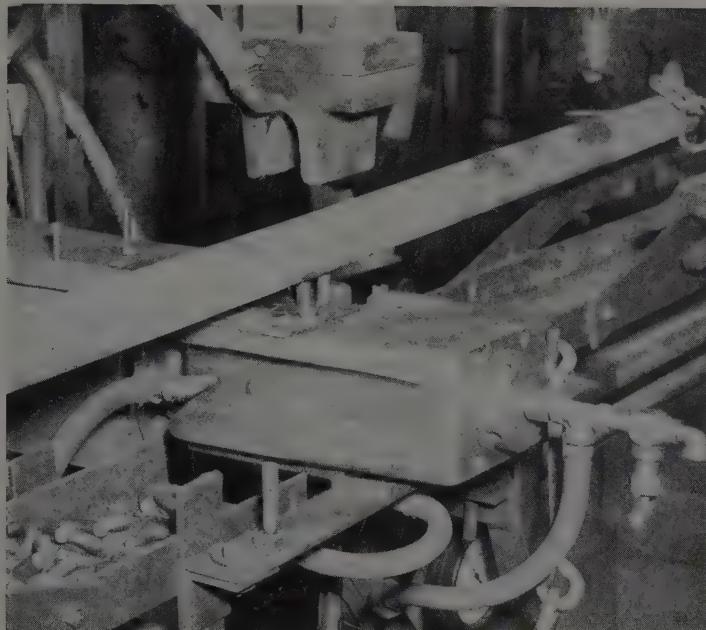
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Unconventional Resistance Welding ... Reduces Production Time and Costs



RESISTANCE welding used to weld draft rings on tractor harrow evener bars now enables Kewanee Machinery & Conveyor Co., Kewanee, Ill., to produce 15 units per hour with the aid of but two operators, whereas former method required three men to complete eight to ten units per hour. Using a "three-phase" welder made by Sciaky Bros. Co., Chicago, the U-shaped mild steel draft rings are resistance welded to the oval-shaped, high carbon steel evener bar as shown in the drawing.

Rings are loaded on lower arm die and bar is clamped with a shaped die on the upper arm, note photo. For one size evener bar, the operation requires four rings to be welded on the inside and two on the outside of each bar. The same machine is used, with die changes, to perform other operations on the harrower.

The company states that since converting this operation to resistance welding, only a few failures have occurred out of several thousand bars manufactured.

type of heat treatment to aircraft exhaust manifolds. This conclusion has special significance when it is realized that aircraft exhaust manifolds encounter no environment in service as corrosive as the copper-sulphate-sulphuric acid solution.

Aside from the metallurgical considerations, there are some manufacturing problems which would add to the cost of the finished product by heat treating at 1600°F. The scale that is formed at this temperature is very tight and thin. Removal of this scale by the usual acid pickling solutions is not readily accomplished. This results in added costs because of sandblasting or special pickling solutions which must be used. It would be necessary, too, to increase furnace capacity for heat treatment at this temperature for the desired length of time, namely, a minimum of $\frac{1}{2}$ hour, instead of the usual annealing heat treatment time of from 10 to 15 minutes. Another manufacturing problem, which is not as serious as far as increase in cost is concerned, is the question of warpage on the finished part caused by this heat treatment.

It has long been known that the presence of precipitated carbides tends to

raise the yield strength of the material when tested at room temperature. From this knowledge the question of increasing the yield strength under high temperature operation by the deliberate precipitation of carbides has at times been raised. Recently, a limited number of tests by other investigators (Miller, Benz, and Day—Transactions of the ASM., V. 32, 1944, pp. 380-407) indicate that at the elevated temperature (1100°F.), stress creep strength is lowered from 10 to 20 per cent by this stabilizing heat treatment. These results would tend to bear out the theory that a small amount of carbide formation along grain boundaries and slip planes within the austenite grain would enhance the strength of the material at elevated temperatures. Data such as this may be a more important factor in determining the service life of an exhaust manifold than any actual corrosion of the material due to exhaust gases.

Serious considerations are in order to establish the allowable amount of chromium carbides, without the danger of inter-granular corrosion, for the enhancement of the high temperature strength of the material. Factual data along these lines are lacking in detail but are proved

in substance by the tens of thousands of exhaust manifolds which have been manufactured in the last 8 years on which no stabilizing heat treatment has been given.

1400 Tests Noted in ASTM 1946 Standards Book

Growth in the number and volume of standards has forced the American Society for Testing Materials, Philadelphia, to publish its 1946 book of standards in five parts. More than 1400 widely used specifications, tests, definitions, etc. are included in condensed form in its almost 7000 pages.

Five sections are as follows: Ferrous metals, nonferrous metals, nonmetallic materials—constructional, nonmetallic materials—coal and coke, petroleum products, aromatic hydrocarbons, soaps, waxes, textiles, gaseous fuels, nonmetallic materials—electrical insulating materials, plastics, rubber, paper, shipping containers, adhesives. Each section has a subject index. Two tables of contents, the first listing all standards under general materials headings and the second according to serial designations of standards, facilitate reference to any of the subjects covered.

MEDART MICRO-MULTICYCLE!

straightening machine designed exclusively for $\frac{1}{8}$ " to $\frac{1}{2}$ " bars and tubing.

Small, compact yet built on the same principle and embodying the same advantages as the Medart 6-in-1 Multicycle Straightener . . . positive, synchronized feed . . . one feeding level . . . two bending cycles . . . single motor . . . and the Medart Micro-multicycle has this PLUS FEATURE: all six rolls are driven! A variable feed-speed range is built into the machine. 3 H. P. motor mounted on base of machine.



MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

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Stamping Operations

(Concluded from Page 102)

Assume that in an automatic progressive die press the part can be produced complete from coil stock at one handling and at a rate of 200 surface feet per minute or 10,000 per hour on the 50-minute basis. Taking the same direct labor and labor burden of \$1.50 per hour plus machine and a tool rate of \$2.50 per hour (five times as great) as with hand fed presses, a total cost of \$4.00 per hour or 40 cents per thousand pieces is obtained, a saving of \$4.00 per thousand pieces.

Factors of Production

This example is undoubtedly oversimplified as included in the discussion of rates should be tool life savings, floor space savings, reduced trucking and helper time as well as the opposing factors of more expensive tools, greater set-up time and higher maintenance. Other factors such as material, material handling, cleaning, finishing, packing, sales etc., may be added to suit, and are substantially independent of the method of production.

Combination tools, multiple tools and progressive operations are all parts of the process which has been changing our home life and commercial life so rapidly during the last century. The desire which is as old as man, to find easier and quicker ways of doing things, is as responsible for the harnessing of the ox to the first crude plow, as it is for the steamship, the vacuum cleaner, the oil burner and the concrete mixer. They all help to make things easier for everyone. Their ultimate result is the higher standard of living which this country enjoys and seeks to improve.

From a discussion before the New England district meeting of Pressed Metal Institute, Hartford, Conn., May, 1947.

Specification Changes

(Concluded from Page 101)

made hydraulic press is used to stretch an 18-gage deep drawing steel into the rough shape of a cab dome.

Other parts are formed by shears, punch and hydraulic presses and a German-made "nibbler," Fig. 6, which is capable of cutting the heaviest steel used in the manufacturing processes into any desired shape without leaving a rough or jagged edge. Unfailing performance is reported by Seagrave users in the operation of eight and twelve-cylinder straight engines which function on dual carburetion and ignition systems. If one engine fails while a pumper is pouring water into a burning building the other cuts in and keeps the fire-fighting apparatus "humming."



this grocer's floor had become a skating rink

...BUT EMPLOYERS MUTUALS SAFETY ENGINEERING MADE IT SAFE AGAIN

Pride of a super grocery was its beautiful tile floor. But through years of cleaning, a greasy substance had accumulated in the joints—and more and more customers slipped and complained.

It became a question of solving the problem or installing a new floor. Many attempts at a solution had failed. Employers Mutuals safety engineers suggested a raised abrasive strip in the joints of the tiles. The result: the floor was saved, the slipping was stopped, the customers' complaints ceased.

* * *

It is in such cases that the real spirit of Employers Mutuals as a service organization, rather than just an insurance selling organization, becomes vital to you. For Employers Mutuals provides especially trained people skilled in safety work—in accident

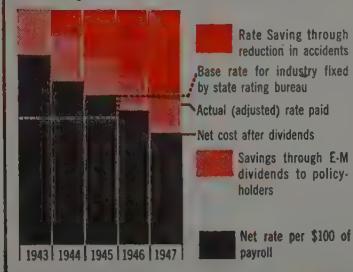
and fire prevention, industrial safety and health education programs—in prompt claim payment, and in other services.

Employers Mutuals are mutual companies, organized, operated and managed for the welfare of its owners—the policyholders. Therefore they furnish all services that help to reduce your insurance costs and at the same time pay back to you—its owners—all savings beyond ample legal reserves, in the form of dividends. All policies are nonassessable.

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It is the way—the human way—in which Employers Mutuals company-trained men analyze your casualty and liability insurance problems, write your policies, study your operations, and pay your claims, that result in lower insurance costs and return to you part of the premium you have paid.

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Large Crankshafts

(Continued from Page 85)

adjustable gibs which bear against the sides of the center of the main bed. These gibs are close together to keep the carriage in alignment as it moves longitudinally. The carriage itself is provided on the outside ends with adjustable gibs to obtain the proper clearance and, in the case of the smaller models, to prevent lifting of the ring housing during machining operations. In the case of the largest machines, weight of this housing is sufficient to prevent any lifting since the machines weigh between 225,000 and 250,000 lb.

Moving carriage parts in contact with the bed are lubricated by a pump moving with the carriage. The pump operates whenever the carriage is moved longitudinally in rapid traverse. Lubricant is difficult to wipe off and will maintain a film of lubrication with a small supply.

This is important since it is not possible to collect the lubricant again and recirculate it. Lubricant is not supplied during a longitudinal feed cut because it is important that the oil pressure should not build up enough actually to lift the carriage and destroy the axial accuracy of the ring housing assembly.

To set the stroke, a motor and handwheel adjustment move the ring housing on the carriage. Both the motor, which is used for cross traverse, and the handwheel, for fine adjustment, are connected to a worm gear and screw assembly which moves the ring housing with the nut secured to the ring housing base. Provision is made so that only the motor

or the handwheel is connected to the worm unit.

When the motor is connected, the handwheel is disconnected; if the handwheel is connected, the motor is disconnected. Pushbutton control for the cross traverse motor is located on the carriage, close to the handwheel for the convenience of the operator.

Oil is supplied to several points of the main ring bearing, Fig. 3. At the left center are a number of pressure gages which indicate the oil pressure before and after the filters, in addition to the pressure in the lines supplying the main bearing and gearbox bearings and gears.

Heart of Machine

Main ring bearing is the heart of the machine. It is particularly important that the accuracy built into it be maintained. It has to take a radial load, thrust in both directions at times and also a vertical lift load during certain portions of the ring revolution. Accuracy with which a crankpin can be turned is no better than the accuracy of this bearing. Since it is larger in diameter than the hole in the ring, every care was taken to see that proper lubrication was obtained. Crankpins as large as 20 in. in diameter have been turned on these machines with less than 0.001-in. out of round.

Ring is driven by a combined variable-voltage motor field-control electric drive. In the case of large machines, a motor generator set is mounted in the top of the left compartment on the ring. Since the ring housing moves with respect to the floor, this means that only alternating-current power lines are brought to the ring housing. The main drive motor

is flange-mounted on to the ring housing.

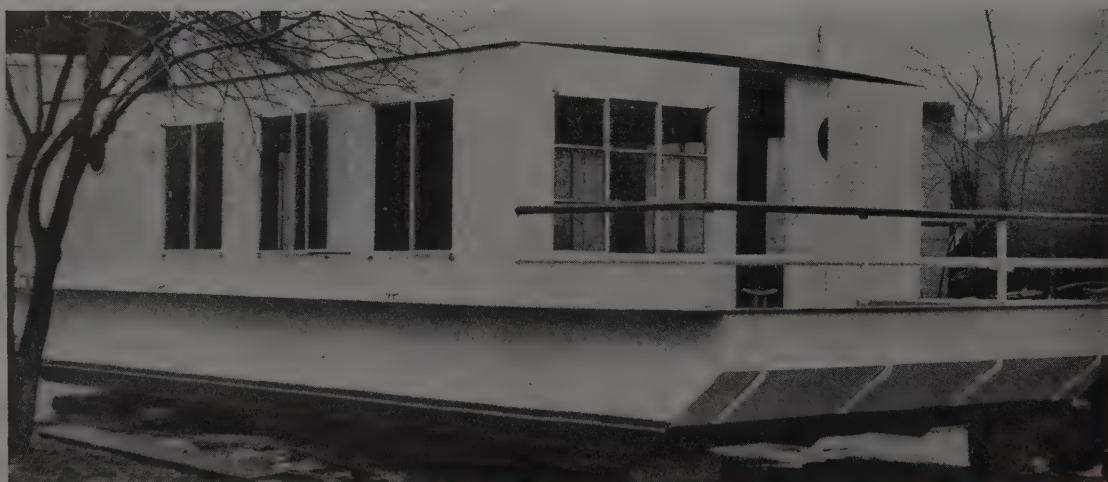
In the gearbox, Fig. 3, double reduction gearing is used to connect the motor to the ring face plate. To control the ring itself, pushbuttons are located on the operator's panel.

Fig. 1 shows method of mounting the tool holder on slides bolted to face of ring face plate. The tool holder is provided with a nut which works on a radial feed screw going from the tool holder into a gearbox mounted on the face plate. Screw is driven by a worm gear assembly which, in turn, is driven by a spur gear pinion.

Whenever this pinion rotates, the radial feed screw is turned, moving the tool holder in or out on the cross slide. In the last design, a slip clutch has been incorporated between the worm gear and radial feed screw. This clutch provides protection in case the tool holder reaches either end of its travel or in case the tool is jammed against the work.

Pinion on the worm shaft of this gearbox is meshed with a large diameter gear mounted on the face plate. This large gear is free to turn on the face plate in either direction. If the gear is stationary with respect to the face plate there will be no radial feed. If it moves faster than the face plate, the radial feed screw will be turned in one direction. If it moves slower than the face plate, the radial feed screw will be turned in the opposite direction.

Three methods of driving the center part of the feed differential are used. In the first case, in order to obtain definite feed in thousandths of an inch per revolution, power is taken from the



BEATING THE HOUSING SHORTAGE: A resourceful war veteran solved his individual housing problem recently with the purchase of this sheet steel arc-welded 28 ft houseboat built by J. E. Baker of Cleveland. In-

terior is laid out in three rooms—galley 5 x 8 ft, living room 12 x 16 ft and shower-style bathroom complete with closeting and cabinets. Photo courtesy Lincoln Electric Co.

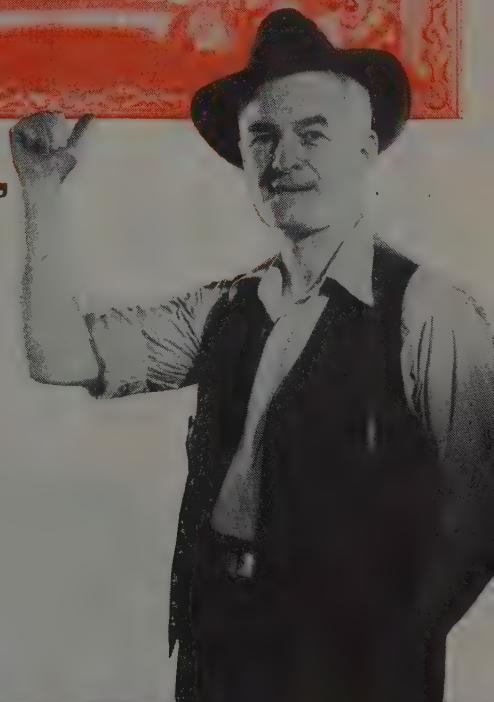


Picture of my No. 1 helper"

With a Roller's ability (and pay) based on tonnage, it's only natural that he favors the rolls that give the biggest boost to his record and bonus. Lewis Rolls have a world-wide reputation for staying on the job longer, taking fewer "vacations" from the stands, and maintaining peak production at less cost per ton rolled.

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LEWIS ROLLS

main drive gear train through a series of shifting gears. These gears are laid out so that eight different output ratios are obtained. The output from this transmission then goes through a reversing clutch to reverse the direction of rotation. From here, power is fed through another differential. The input shaft is connected to one side of the differential by means of a worm gear.

The other side of the differential is driven by the radial rapid-traverse motor which normally is stationary when under power feed. Either half will drive the center part of the differential which, in turn, is connected to the center part of

the feed differential. Only purpose in using the second differential is to eliminate the necessity for any clutches or disconnect gears to combine the power feed and the rapid traverse motor. With this combination, the operator can be running the tool in under power radial feed and at the same time operate the rapid traverse motor, if he so desires, either in or out without doing any damage to the equipment.

Third method of driving the radial feed is by handwheel. If the power radial feed is in neutral, it is possible to engage the handwheel gear in the train of gears leading to the power side

of the second differential. Here again, the gearing is interlocked so that it is not possible to operate the radial feed under power in case the handwheel is connected.

By properly selecting lever position radial feeds from 0.008 to 0.240-in. per revolution can be obtained. Amount of feed is laid out so as to increase in geometric progression. Another lever is used for interlocking the radial feed handwheel and the power feed. When this lever is thrown so that the radial feed handwheel can be engaged, the smaller of the two handwheels on the same shaft can be used for hand radial feed. Horizontal lever under the two handwheels, Fig. 1, is for feeding the tool in or out by power feed as it controls the reversing clutch described above.

The larger diameter handwheel is for longitudinal feed of the carriage. A train of gears is connected from this handwheel to a nut on the longitudinal feed screw. Whenever the handwheel is rotated, it will in turn, rotate the nut and feed the carriage longitudinally.

On 40-in. and smaller size lathes, this longitudinal feed screw is turned to give the power longitudinal feed. For obtaining the low rates of feed when cutting, a wide range variable-voltage direct-current drive is used. This is controlled by a combined rheostat, part of which is in the generator field and part in the motor field. Actual power from the motor is transmitted through a worm gear to one part of a differential.

A rapid-traverse motor is connected to the other half of the differential also by means of a worm gear. Center part of the differential is connected to the feed screw. With this arrangement it is possible to run the longitudinal direct-current feed motor and then to superimpose the rapid-traverse motor in either direction in case the operator so desires in an emergency.

Lubricated Lathe Shaft Developed

Lubricant introduced through a special lathe center into a hole in the center of heavy shafts being machined prevents shaft centers from "picking up", according to General Electric Co., Schenectady, N. Y. The new lathe center permits the shaft to be lubricated while the cut is being taken and reportedly keeps the lubricant free from foreign matter.

Pressure gun forces lubricant into hole in center of shaft through a fitting on shank of lathe center. When the shaft center is full, extrusion takes place along a 1/16 x 1/16-in. groove on outside of lathe center. As shaft turns, lubricant is wiped against shaft center.

Here's Proof of Performance!

Comparison of Costs of Lining Soaking Pits In A Well-Known Steel Mill		
Explanation—Convinced that the most accurate method of comparing the relative costs and performance of Buckeye Silica Firestone with another material used for many years, a test under identical operating conditions was conducted by a well-known steel plant with the following results:		
Buckeye Silica Firestone	Other Material	
Maintenance cost per ton of ingots heated	.0005	.0033
Installation cost per ton of ingots heated	.0069	.0089
Total cost: Maintenance and installation	.0074	.0122
Approximate life of soaking pit linings	4 1/2 yrs.	2 yrs.
Increased cost of other material over stone		64.8%
Average annual maintenance cost, ratio of stone to other material: 1 to 6.		

You, Too Can Enjoy Buckeye Efficiency and Economy

Buckeye's record in hundreds of other steel plants indicates what it can do for you. A Buckeye service engineer will gladly point out its many advantages and discuss its application to your particular problem. Write!

THE CLEVELAND QUARRIES COMPANY

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• Full explanation of Buckeye is found in Bulletin 15-B

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RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

Electroplating Line

(Continued from Page 83)

1. Power wash in slot-type chambers with vertical rows of spray nozzles discharging alkaline solution at rate of 1500 gallons per minute. Solution is recirculated, with a sump tank provided to replenish solution and flow off oil and grease.
2. Hot water rinse.
3. Dip in alkaline electro-cleaner solution held at 190 degrees F.
4. Water rinse. Rows of spray nozzles are positioned to direct streams on parts as they are raised from the tank, shutting off automatically as the rack of parts clears the top of the tank.
5. Acid dip.
6. Water rinse.
7. Water rinse.
8. Cyanide copper strike.
9. Water rinse.
10. Acid dip.
11. Water rinse.
12. Copper plate (DuPont high-speed copper solution) in main tank, holding 58,000 gallons of solution, with six rows of anodes flanking the three lanes of parts. Solution is turned over twice an hour or the entire tank may be pumped out in 30 minutes. Anode bars are 9 feet long and 8 inches wide.
13. Lower to dragout tank to conserve copper plating solution.
14. Cold water rinse.
15. Hot water rinse.

General Motors plating specifications currently call for copper plating to a depth of 0.001-inch. Buffing is calculated to remove about 0.0002-inch of this layer which is replaced by a copper plate in the nickel plating section. Nickel thickness is 0.0005-0.0008-inch, and the final chrome plate is of course only a flash layer.

Sequence through the nickel section is as follows:

1. Solvent soak in alkaline soap.
2. Power wash in chambers similar to copper section.
3. Alkaline electro-cleaner.
4. Water rinse.
5. Copper strike.
6. Water rinse.
7. Acid dip.
8. Water rinse.
9. Copper plate (Unichrome solution) in 27-foot tank, operated at somewhat lower temperature than original copper plate. Thickness applied about 0.0002-inch.
10. Cold water rinse.
11. Hot water rinse.
12. Bright nickel plate in solution held at 140 degrees F. (An auxiliary 1150-gallon electrolytic puri-



Thousands of tests, under all kinds of service conditions, prove that "Dutch Boy" Red Lead gives metal extra protection

4 Ways RED LEAD RESISTS EFFECTS OF WATER ...guards against Rust

Maintenance engineers have long recognized Red Lead as the "standard" metal protective paint. This acceptance is based, to a great extent, on its marked ability to stand up against moisture, a powerful factor in the rusting process.

Now, scientific research into the inherent properties of the pigment itself, shows just how and why Red Lead resists the effects of water. Briefly, there are four reasons:

1. Red Lead resists water "pick-up"—If a series of various metal protective paint films are weighed and then submerged in water (salt or fresh), it is readily noticed, on reweighing after several days immersion, that Red Lead films have outstanding resistance to the absorption, or "pick-up," of water.

2. Red Lead resists passage of moisture—Rusting of metal will not take place if water does not

Testing Water Permeability of Paint Films—With this standard apparatus a measure of the amount of water that passes through a unit of film is obtained.

Experiments show that a straight linseed oil film allows three times as much water to pass through the film as when the same film is pigmented with Red Lead.



penetrate the paint film to reach the metal. Water permeability tests of paint films (see illustration at lower left) show, beyond question, that Red Lead is one of the most effective metal protective pigments, because of its stubborn resistance to the passage of moisture through the film.

3. Red Lead resists solution by water—The action of water on paint films results in a partial dissolving of the film. Many metal protective films lose a considerable percentage by weight of their films through solution in water. On the other hand, the solubility losses of Red Lead paint films are practically negligible.

4. Red Lead resists distortion by water—Red Lead films have little tendency to shrivel or change in size during immersion in water. This is imperative to good metal protection. For good protection depends on good adhesion, and a paint film maintains better adhesion when it is not distorted by the action of the water.

Remember, too, Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including the fast-drying resin types.

Specify RED LEAD for ALL Metal Protective Paints
The rust-resistant properties of Red Lead are so pronounced that it improves any metal

protective paint. So no matter what price you pay, you'll get a better paint if it contains Red Lead.

WRITE FOR BOOKLET—"*Red Lead in Corrosion Resistant Paints.*" This authoritative guide is available to those responsible for specifying and formulating paints for structural iron and steel. It describes in detail the scientific reasons for Red Lead's superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal protective paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6; Buffalo 3; Chicago 8; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va., (Evans Lead Division).



DUTCH BOY
RED LEAD

fication tank is operated to keep the nickel solution purified. Tank is about 4 x 15 feet in size, loaded with about 400 nickel anodes and operated at low current density, removing all metallic impurities in the solution circulated through it from main nickel tank.

13. Cold water rinse.
14. Hot water rinse.

Through the transfer mechanism, racks of parts are removed from the main plating conveyor and routed through another buffing department, principally for smoothing out any surface irregularities or other defects which might show through the light chrome plate to follow. As explained before the chrome section has two lanes of parts, with horizontal bars spaced 36 inches apart and traveling at faster speed than the copper or nickel lines. Sequence of operations is as follows:

1. Power wash as before.
2. Alkaline electrocleaner.
3. Water rinse.
4. Acid dip.
5. Water rinse.
6. Water rinse.
7. Chrome plate.
8. Spray rinse.
9. Water rinse.
10. Water rinse.

Following inspection and minor touch-up of "burned ends" or other blemishes, the parts are routed to assembly points.

Although a minimum of operators is required to handle this large plating set-up, special safety precautions have been taken throughout. A catwalk extends the full length both sides of each of the three sections of the plating line, slightly above the level of the tops of the tanks. Along this walk is a control cord which, when depressed by an operator, stops the entire machine line. At six other points in the installation there are also emergency stop controls. The moment one of them is actuated, a light flashes on a signal board, showing what station occasioned the stop. Only when this station is clear can the line be started, and then only by an operator at a master control panel located at the start of the line. When he sees the trouble light in question is "off", he sounds a warning signal for 30 seconds, and then can start the conveyor line.

As mentioned before, the auxiliary storage tanks and high-capacity pumps permit quick emptying of solution tanks should trouble develop in them. Pumps rated at 1500 gallons per minute are powered by 75-horsepower motors. All major plating tanks are rubber lined, and the chrome tank is both lead and brick lined. Lined tanks have bottoms covered with loose brick to prevent damage from falling parts. All heated tanks have

automatic heat controls. Rinse tanks have level controls, and many of them feature spray nozzles across the top of which come on and off automatically as racks of parts pass by them.

A word is in order about the generator facilities. Direct current is supplied by 22 Chandeysson motor-generator sets, ranging in capacity from 5000 to 15,000 amperes, with 6 volts on the copper solution, 9 volts on the nickel lines and 12 volts on the chrome lines. In the chrome solution tank, for example, current is supplied by two 15,000-ampere and two 10,000-ampere generator sets, each driven by a 400-horsepower synchronous motor operating at 180 rpm. The 5000-ampere generators are used to supply current to the electrocleaner tanks. Total generator capacity is 285,000 amperes.

Plating racks are coated with a thermosetting vinyl plastic. A special department is provided for rack maintenance. For complete coating the racks are dipped into a primer coat and two finish coats, then passed through a small oven lined with infrared lamps to produce a temperature of 350° F., at which heat the plastic sets. The same material is used to touch up racks which may have developed bare spots.

The entire project was engineered and installed by the George L. Nankervis Co., Detroit. The plating machine themselves were built by Meeker Mfg. Co.

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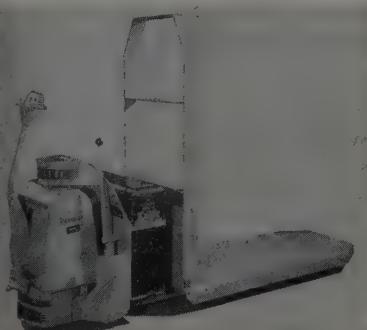
1. Circulating Pump

Built on centrifugal principles, the Rumaco model L-B circulating pump, made by Ruthman Machinery Co., Cincinnati 2, is provided with opposing inlet and outlet for standard (125 lb) 2 in. pipe flanges. Totally-enclosed driving motor, directly connected to the pump, is equipped with grease-packed sealed precision ball bearings. No added lubrication is necessary.

Motor stator is dynamically balanced by dyneric process to close limits, insuring vibrationless and quiet operation. It may be installed in pipe lines of various sizes by use of pipe reducers, and may be operated at any angle from a vertical to horizontal position.

2. Skid Handling Truck

Both high and low skid platforms—even with a variance in height of as much as 5 in.—may be handled with the same piece of equipment developed by Automatic Transportation Co., 149 West 87th street, Chicago. This motorized hand truck, a special model of the



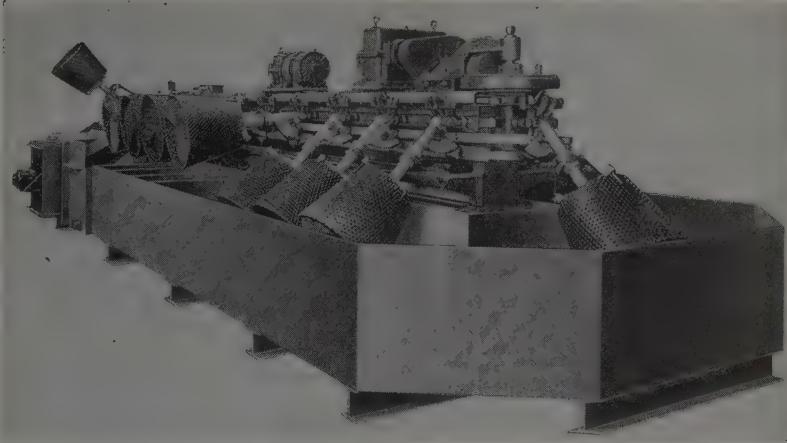
Transporter, features a hinged rack which stands upright at the front of the truck's platform (as illustrated) when low skids are being handled and which is lowered to lie flat on the platform to give added height when high skids are being lifted.

Except for special rack, designed to fit particular skid platforms, the special truck has the same operating features of the standard unit and is available with either electric or foot lift.

3. Electrical Contacts

Good arc resisting characteristics are claimed for the silver-molybdenum electrical contacts manufactured by Gibson Electric Co., 8360 Frankstown avenue, Pittsburgh 21. Material is now supplied in two grades, Gibsiloy M-10 and M-12, the former for small size circuit breakers handling lower pressures and the latter,

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 134



containing a higher percentage of molybdenum, for heavy circuit breakers. M-10 has a hardness of 75 rockwell with 50 per cent of the conductivity of pure silver. M-12 has a hardness of 85 with 45 per cent conductivity.

4. Rack Coating

Air-Dry rack coating 266, announced by U. S. Stoneware Co., Akron, O., reduces time required to apply such coatings, requiring but 2 dips. It is resistant to all plating solutions, including hot alkaline cleaners and requires 20 to 30 min drying time per coat. The coating will adhere to all surfaces, is flexible and resilient and will withstand mechanical shock in handling.

5. Plating Machine

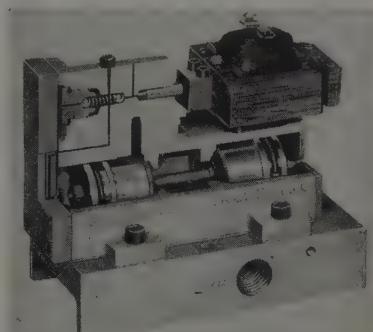
Complete processing cycle of cleaning, acid, strike, plating, rinses, bright dip and drying is provided in the return type fully automatic plating machine developed by Frederic B. Stevens Inc., Detroit. Work to be processed is loaded and returned to practically the same point, permitting one operator to load plating basket and move away filled containers.

After manual loading, plating basket arm assembly attached to a conveyor chain travels over the stationary hump type cam to the first processing tank. The basket rotates while it is in the various treatment tanks. This procedure is followed through processing tanks to the unloading point, where treated parts are automatically unloaded.

Plating time may be increased or decreased by adjustment of a timer located on machine's intermittent control panel. Basket advances intermittently, 30 in. during each period of movement, then dwells a predetermined period of time. Delayed set down mechanism is available for providing wide independent variation of treatment time. Solid anode rods are provided in cleaner, strike and plating tanks. Solid cathode rod is mounted on the machine.

6. Air Valve

Designed by Automatic Valve Inc., 37415 Grand River, Farmington, Mich., a new compact, three-way, three-port,



solenoid-operated air valve controls single action air cylinders actuating machine tool operation. Designated as SV-3, it may be attached close to air cylinders, eliminating piping and waste of air. It may be mounted in any position.

Made either normally open or closed,

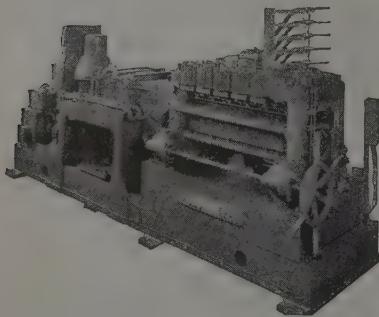
this balanced piston type valve, is pressure sealed and reversible in servicing and assembly. Operation is on pressures from 5 to 150 psi. Power values are 1.42 amp at in-rush and 0.22 amp sealed, for 110 v 60 cycles. Valve is available in $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$ -in. sizes.

7. Tool Holders

A line of all-steel floating tool holders is announced by Barnaby Mfg. & Tool Co., 70 Knowlton street, Bridgeport 8, Conn. Of conventional design, they are available in shank diameters of $\frac{5}{8}$, $\frac{3}{4}$, 1 and $1\frac{1}{4}$ in. Cutting tool is held in the head of the holder, either directly or by means of a bushing, and is clamped by a hardened steel set screw. A hinged shoe bushing blank is furnished with the holder.

8. Roller Leveler

Properly backed up, a roller leveler, made by Voss Machinery Co., 2882 West Liberty avenue, Pittsburgh 16, has $\frac{3}{4}$ -in. diameter work rolls which flatten alloy and perforated sheets from 0.010 to



0.030-in. thick and up to 28 in. wide. Control is from levers mounted on the top of the machine and a hand wheel located below them, all placed at end of the machine near the electrical controls for the variable speed drive.

Leveler, known as inverted type, has a tiltable lower flight of rolls made possible due to simplified construction. One operator can control all phases of the machine.

9. Arc Welders

Large illuminated current indicating scales are features of the new industrial alternating current transformer welders made by Hobart Brothers Co., Troy, O. Each scale is uniformly calibrated so that the large figures are evenly spaced from minimum to maximum welding heat settings. Both primary and secondary coils of the welders move when adjustment is made, the time required to make a given change in welding heat being lessened.

Machines have a high full load efficiency and a low no load input. All coils are made of glass-covered copper strap. Circuit reactance and no load voltage are so balanced as to make arc starting prompt and easy for any thickness of metal. Capacitors are built in for power factor correction. There are no electrical connections between power lines and

voltage adjustments. Voltage taps are in approximate 1 v steps. Direct current output current is not broken with the controls.

12. Soldering Iron

Perfect in balance and enabling operation in a more natural position, a hatchet type soldering iron manufactured by Hexacon Electric Co., 139 West Clay avenue, Roselle Park, N. J., has heating elements enclosed in a damage proof barrel, hexagonal shaped for clamping in a vise for easy tip removal. Bearing catalog No. 300H, it has a high-heat alloy core which resists scale.



welding cables. A fan at bottom of case draws cool air through drip proof louvers at top.

Welders are offered in 300 and 500 amp sizes for operation on single-phase, 60 cycle current, either 220/440 or 550 v.

10. Latching Relay

A multicircuit switching relay of the latching type, known as type 6FZ, is manufactured by Sigma Instruments, 70 Ceylon street, Boston. With dynamically balanced moving system, operating with detent forces of over 200 gram-inches, freedom from effects of vibration and shock is attained. Each of eight switch positions may be normally open or normally closed, carrying a rating of 5 amp at 110 v ac or 24 v dc.

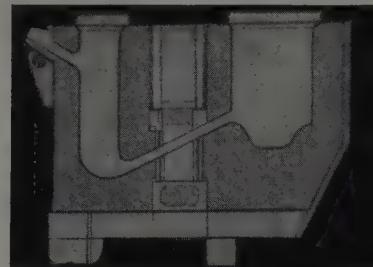
11. Selenium Rectifiers

Addition of a line of selenium rectifiers with tap switch controls is announced by Richardson-Allen Corp., New York. These self contained units include basic rectifier, motors and shunt, also incorporating tap switches for 6, 9 and 12 v for 500 and 1000 amp capacity, 6 and 9 v for 1500 amp and combination 6/12 and 9/18 v up to 1000/500 amp capacity.

Separate remote controls will employ tap switches from 12 v-500 amp to 6 v-5000 amp. A 3-gang switch gives the advantage of one control for making

13. Induction Furnace

Two chambers, one for charging and one for pouring, connected by a series of straight line channels, comprise the induction melting furnace for aluminum, brass and zinc, introduced by Fisher Furnace Division, Lindberg Engineering Co., 2444 West Hubbard street, Chicago 12. Metal in pouring chamber is always at pouring temperature; adding cold metal to charging chamber does not affect pouring chamber temperature (within reasonable operating limits) and



only clean residue-free metal reaches pouring chamber.

Both chambers are refractory lined. Operation is cooler as induction heating heats metal only, not the entire furnace. Covered chambers prevent heat radiation except when charging or ladling. Units are available in 100, 300, 500 and 1000 lb per hour melting capacities.

14. Screw Threading Automatic

Six-spindle automatic screw machines built by Greenlee, Bros. & Co., Rockford, Ill., are equipped to handle lead-screw threading which eliminates many secondary operations and helps speed production of work pieces requiring threads with a very accurate lead. The new mechanism is combination cam and lead screw operated and may be used in third, fourth and fifth positions on the machine. It is offered for six-spin-

dle machines of 1, 1½ and 2-inch bar capacity.

Leadscrew attachment itself consists of a threading spindle unit, a removable 1-inch outside diameter lead-screw and bronze nut, safety shear keys, outboard bearing support and a yoke to operate self opening die heads. The threading spindle drive shaft is about 10 inches



longer than the conventional drive shaft of threading attachments used on the company's machines.

Without changing the threading drive spindle, the threading arrangement can be set up to handle conventional, cam-operated threading jobs. For ordinary work requiring class 1 or 2 threads, it is only necessary to remove the lead screw and nut from the threading spindle drive shaft and adjust the standard threading box cams to meet stroke requirements.

15. Photographic Copier

The model B Tru-Copy-Photo machine, a portable electric unit designed for copying pages from heavy bound books, is announced by General Photo Products Co., Chatham, N. J. Copy surface of machine measures 8½ x 14 in. and is equipped with a collapsible stand which fits over copy. It features removable color filter, automatic timer for exposures, red dark room or warning light to enable use of extremely sensitive film or paper without other means of illumination, and a manual switch in addition to timer for longer or shorter exposures.

16. Radiator Flushing Device

The Radi-Flush is a device designed for reverse flushing of automobile, truck, tractor and airplane radiators and blocks by White Engineering & Mfg. Co. Inc., 122 West Passaic street, Rochelle Park, N. J. Flushing is accomplished by steam and chemicals, using steam generated by a vapor steam cleaner in which the cleaning compound is mixed.

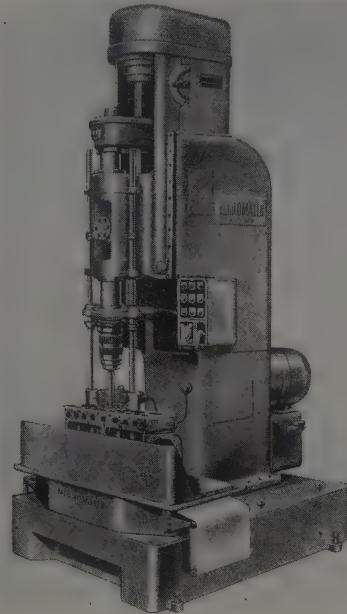
17. Safety Containers

Safe Guard safety containers, announced by General Detroit Corp., 2272 East Jefferson avenue, Detroit 7 and General Pacific Corp., 1501 East Washington boulevard, Los Angeles 21, are available in 1, 3 and 5 gal sizes for storing and carrying flammable and volatile

liquids. Containers are constructed of terne plate, lead coated inside and out. Pouring spout is of nonsparking die cast brass.

18. Honing Machine

Micromatic Hone Corp., Detroit, announces a unit constructed, single spindle, heavy duty Microhoning machine with quill type spindle for honing bores from 1 to 4 in. diameter and up to 9½ in. long. Machines are made with three units assembled in column and base of any Micromatic Microhoning machine;



head unit consisting of spindle, hydraulic control panel, stroke control mechanism, and speed control in one integral assembly; hydraulic unit, with hydraulic pump, tank and pressure control valves; and electrical unit consisting of electric control panel.

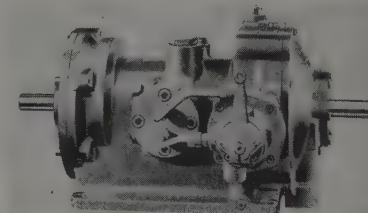
To permit faster stroking without increased power input, and to accomplish faster stock removal, all weight that must be reciprocated to stroke the tool is minimized. The spindle is the piston rod with rings that act as the piston. Spindle alignment with the work is assured as torque and thrust is taken by the quill closely above the tool.

19. Fluid Power Transmission

Smaller, lighter, speedier in design than previous models, the new reversible variable speed fluid power transmissions made by Oilgear Co., 1801-1417 West Bruce street, Milwaukee 4, consist of a volumetric, variable delivery, radial rolling piston pump driving a constant displacement radial rolling piston motor.

High grade oil, as the fluid power, flows from unit to unit through adequately proportioned passages, providing automatic forced and flood lubrication.

Transmissions are suitable for wire coating and rewinding machines, spring coiling machines, small draw benches, grinding wheel head drives, etc. Units are practically unaffected by variations



in load. Overload protection is automatic.

Various devices are offered for use with the transmissions, such as a hand screw for setting of output shaft speed in either direction, a Hydraulic servomotor lever for instantaneous and stepless variation of output shaft speed in either direction and for quick reversal. An electric three-position remote control adjusts speeds in either direction.

Input speed is 1750 rpm and output speed at normal torque is variable up to 1600 rpm. Starting and normal continuous torque are 125 and 90 in. lb., respectively. A 2 or 3 hp 1750 rpm motor is required.

20. Shaper Vise

For use in any size of make shaper from 16 to 32 in., the Queen City shaper vise, made by Cincinnati Machinery Co. Inc., 222 East Second street, Cincinnati, holds work in place for standard shaper operations. Heavy duty, with single screw, parallel jaw and graduated swivel base, it locks in position and swivels to any angle by releasing two bolts.

Screw passes through both movable and solid back jaw, followed by end nut and keyed washer to prevent loosening of screw. Steel inserted jaws are 11½-in. wide and 2½-in. deep, opening to 13½-in. Weight of complete unit is 262 lb.

21. Cutter Sharpening Machine

Cutters are sharpened by grinding on the formed profile of the cutting edge instead of the flat rake face of the tooth on the contour cutter sharpening machine announced by Cincinnati Milling Machine Co., Cincinnati 9. Teeth ground by this method retain their original shape and strength with repeated sharpenings. The new machine generates contours on cutter teeth by duplicating a metal master template of the desired shape which

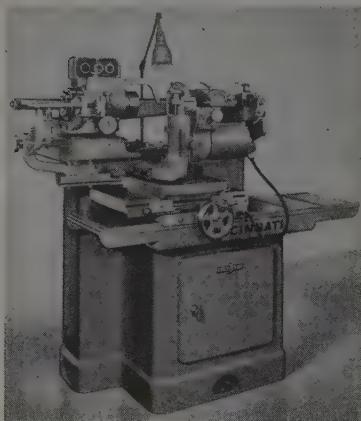
may be used for an indefinite period.

Tracing action in following the master template is hand controlled and practically effortless as wheelhead unit is carried on an antifriction mounting which provides free longitudinal, transverse and swivel movements. Wheelhead also has a vertical positioning slide for grinding clearance of "back-off" angles, and a transverse positioning slide to compensate for wheel wear. Grinding wheel is trued to a radius by use of the swivel

rpm, gasoline engine. Unit has oil bath air cleaner, ignition filtered and shielded and rubber vibration absorbers. It is available with gravity feed or fuel pump fuel systems. Gasoline consumption is 2½ hours per gallon.

23. Floor Machine

Utilizing a powerful motor driven floor brush and capable of scrubbing, polishing, waxing, sanding, steel-wooling, etc., the Tornado floor machine, made by Breuer Electric Mfg. Co., Chicago 40, Ill., may be used on any type of floor or floor covering with an interchange of suitable brushes. It may also



base movement and gages are supplied for positioning the diamond to generate 1/16 and 1/8-in. radii on the grinding wheel.

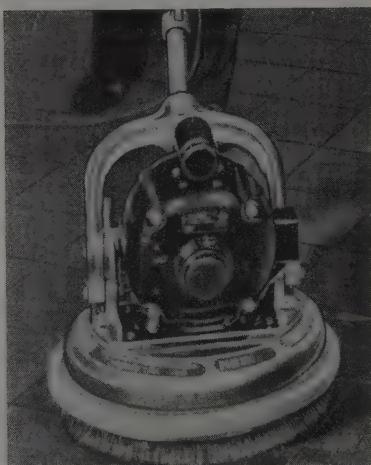
Workhead spindle is antifriction bearing mounted and has No. 40 series National Standard taper. A lead generating device permits grinding of cutters having helical teeth and, since lead and rake angle of tooth are interrelated on form cutters, a mechanism is incorporated to provide compensation for rake angle. Cams are supplied having leads of 30, 40, 50, 60, 80 in. and infinity.

22. Light Plant

With an alternating current capacity of 2500 w, the new light plant introduced by Kato Engineering Co., Mankato, Minn., is self-excited, cranks from 24 v battery and has a direct current winding of sufficient capacity to charge a standard 32 v glass jar type battery. In reality a combination ac-dc plant, the unit is complete with battery charging relays and the charging rate automatically adjusts itself.

When the plant is carrying a full alternating current load, there is little, if any, direct current battery charging. Plant may be furnished with full automatic control or remote control. Voltage regulator holds alternating current voltage within 5 v change between no load and full load.

Generator is mounted integral with a Briggs & Stratton ZZP, 1 cylinder 1800

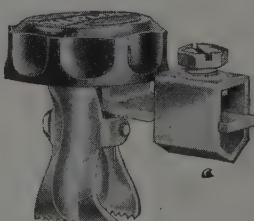


be equipped with a solution tank feeding directly into base of bristles.

Five models are available, ranging from 1/4 to 1 hp with operating brush spreads from 12 to 20 in. All models have enclosed gears in cast aluminum housings and splash-proof, continuous load motors.

24. Test Clamp

Furnishing a vise-like grip on flat or round objects up to 1 in. diameter or width, such as fuse clips, meter or motor terminals, cables, bus bars, battery posts,



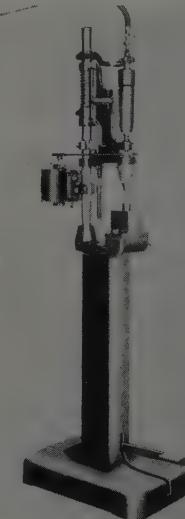
etc., the U-66 Kliplok test clamp, made by Trico Fuse Mfg. Co., 2948 North 5th street, Milwaukee 12, may be used with saws, dust collectors, drills, welders and other portable equipment.

Slight twist of its large finger tip knob exerts tremendous pressures. It will carry up to 150 amp continuously and 200 amp intermittently. The solderless lug accommodates No. 2 wire minimum, No. 0 wire maximum and swivels around the clamp.

25. Riveting Machine

Hammer action combined with rotation in the assembly of parts made of metal, plastics, porcelain, etc., is possible with the pneumatic riveting machine made by Schlack Mfg. Co., 13259 Birwood avenue, Detroit 4. Called the Pneu-Spin, the machine has four interchangeable heads for rivet capacities to 3-32, 5/32, 1/4 and 5/16-in., based on soft steel.

Tool mounts a motor driven spindle for peening tools to form round, oval



or flat heads; to peen shafts, pins and studs; to flare small tubes and brass connectors; and to furl shoulder bushings and light tube of sheet metal. Spindle is carried on a spring supported frame, sliding on a vertical column equipped with a foot pedal to bring the tool down on the work. Above spindle head is a pneumatic hammer which imparts 4000 to 6000 blows with a 1/4-in. stroke from a 75 to 80 lb air supply. Force and frequency are adjustable.

Spindle movement is through 2 1/2-in. and vertical adjustment through 4 1/2-in. Throat measures 4 1/2-in. Spindle motor is 1/8 hp, 1200 rpm.

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Metalworking Operations Curbed by Steel Shortage

Supply-demand balance still some distance away despite improvement in certain products. Fourth quarter allotments to consumers of especially tight items being cut as mills seek to balance order books by yearend. Scrap continues easy

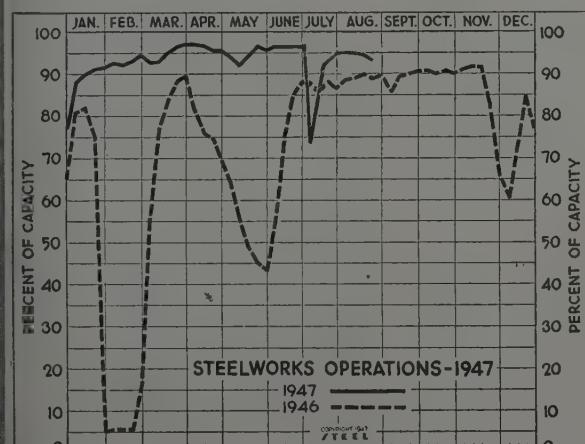
STEEL shortages continue a stumbling block to uninterrupted operations in many metalworking lines despite reported improvement in supplies of some products.

Projected shutdowns of certain General Motors divisions over the next two weeks because of lack of steel provide the outstanding example of the tight supply situation at the moment, but less conspicuous shutdowns and curtailments are sufficiently common to indicate even more so that hoped-for supply-demand balance in steel is still some distance away.

Pressure for shipments is strong for virtually all major products. Light flat-rolled items are in especially heavy demand, followed closely by merchant pipe, plates, shapes and bars. Aside from cold-drawn bars, stainless and alloy steels and some types of wire, the general stringency in supply which has plagued consuming industry for months past persists, with no substantial early easing in the situation in prospect.

Most steel sellers are talking of getting their order books into balance by the end of the year and to this end are limiting fourth quarter consumer quotas accordingly. In some cases allotments for the period, it is understood, will be slashed rather drastically. One midwestern sheet producer, for instance, has announced quotas for the period amounting to less than two-thirds of current quarter allotments.

Such action is bound to adversely affect metalworking operations in the closing months of the year, and while some improvement in mill order books is likely to result, indications are that few, if any, producers of items in tightest supply will be able to catch up with demand by yearend.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended	Aug. 23	Change	1946	Same Week
Pittsburgh	97.5	— 2.5	97	50	
Chicago	90.5	— 3	92.5	80.5	
Eastern Pa.	93	None	81	70	
Youngstown	92	None	88	72	
Wheeling	89	+ 7.5	85	96	
Cleveland	93	— 3.5	90	77	
Buffalo	88.5	None	86	62.5	
Birmingham	99	None	93	95	
New England	92	+ 2	86	78	
Cincinnati	87	None	84	86	
St. Louis	82	— 2.5	54.5	65	
Detroit	88	None	86	81	
Estimated national rate	93	— 1	89	70	

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

Major market attention last week centered on the Federal Trade Commission's action citing the steel industry on charges of price fixing and monopolistic practices, the multiple basing point system being the principal target for attack. In some quarters the move is interpreted as aimed at bolstering the government's drive for lower prices. However, with a long-drawn out legal battle in prospect, one which possibly may take years to adjudicate, it is difficult to see how it could have any effect on the current price structure. Steelmakers do not appear unusually concerned being confident they can substantiate the legality and economic practicality of the basing point pricing system. Most authorities are of the opinion adoption of an f.o.b. mill pricing system, which seems favored by the FTC, would result in serious economic dislocations.

Meanwhile, the recently announced new schedule of steel prices appears to be taking hold firmly. Some additional adjustments are likely as experience develops flaws in the new lists, but, in the main relative stability in prices is expected for some time to come. The scrap situation, however, continues troublesome. Scrap prices continue on the easy side and steelworks grades have been marked down slightly from a week ago, STEEL's scrap composite being down less than \$1 this week to \$37.91. Some trade authorities think the mills will not enter the market as large and consistent buyers until heavy melting steel hits \$35 per ton.

For the second consecutive week, the national ingot operating rate eased 1 point, dropping to 93 per cent of capacity. The rate declined 3½ points at Cleveland to 93 per cent, 3 points at Chicago to 90.5 per cent, and 2½ points at Pittsburgh and St. Louis to 97.5 per cent and 82 per cent, respectively. The Wheeling rate jumped 7½ points to 89 per cent while the New England rate was 2 points higher at 92 per cent.

STEEL's composite price average for steelmaking scrap declined last week to \$37.91 compared with \$38.50 the previous week and the recent high of \$41.75. The price average for steelmaking pig iron advanced to \$36.56 from \$35.80. Finished and semifinished steel price composites held unchanged at \$75.41 and \$56.80, respectively.

COMPOSITE MARKET AVERAGES

	Aug. 23	Aug. 16	Aug. 9	One Month Ago	Three Months Ago	One Year Ago	Five Years Ago
Finished Steel	\$75.41	\$75.41	\$75.41	\$70.80	\$69.82	\$64.45	\$56.73
Semifinished Steel	56.80	56.80	56.80	53.04	52.10	40.60	36.00
Steelmaking Pig Iron	36.56	35.80*	35.61	33.82	32.49	27.50	23.00
Steelmaking Scrap	37.91	38.50	41.75	37.23	29.75	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe.
 Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods.
 Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City, Steelmaking Pig Iron Composite:—Steel and Youngstown. Steelworks Scrap, net tons; others, gross tons

* Revised.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago
 Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	Aug. 23, 1947	July, 1947	May, 1947	Aug., 1946
Steel bars, Pittsburgh	2.90c	2.66c	2.60c	2.50c
Steel bars, Philadelphia	3.28	3.06	2.98	2.86
Steel bars, Chicago	2.90	2.66	2.60	2.50
Shapes, Pittsburgh	2.80	2.54	2.50	2.35
Shapes, Philadelphia	2.94	2.70	2.64	2.48
Shapes, Chicago	2.80	2.56	2.50	2.35
Plates, Pittsburgh	2.95	2.71	2.65	2.50
Plates, Philadelphia	3.15	2.91	2.85	2.558
Plates, Chicago	2.95	2.71	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.56	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.55	3.27	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.90	3.63	3.55	4.05
Sheets, hot-rolled, Gary	2.80	2.56	2.50	2.425
Sheets, cold-rolled, Gary	3.55	3.27	3.20	3.275
Sheets, No. 10 galv., Gary	3.90	3.63	3.55	4.05
Strip, hot-rolled, Pittsburgh	2.80	2.56	2.50	2.45
Strip, cold-rolled, Pittsburgh	3.55	3.27	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.675	3.475	3.425	3.05
Wire nails, Pittsburgh	4.25	3.975	4.125	3.75
Tin plate, per base box, Pittsburgh	\$5.75	\$5.75	\$5.75	\$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

	Sheet bars, Pittsburgh, Chicago	\$60.00	\$52.00	\$50.00	\$38.00
Slabs, Pittsburgh, Chicago	47.50	43.60	42.00	39.00	
Rerolling billets, Pittsburgh	47.50	43.60	42.00	39.00	
Wire rod $\frac{1}{2}$ to $\frac{1}{4}$ -inch, Pitts.	2.925c	2.60c	2.55c	2.30c	

† Base, No. 5 to $\frac{1}{2}$ -in.

Pig Iron

	Aug. 23, 1947	July, 1947	May, 1947	Aug., 1946
Bessemer, del. Pittsburgh	\$37.83	\$36.03	\$34.83	\$29.70
Basic, Valley	36.00	34.20	33.00	28.00
Basic, eastern del. Philadelphia	38.72	36.92	35.52	30.90
No. 2 fdry., del. Pgh. N. & S. sides	37.33	35.53	34.23	29.90
No. 2 fdry., del. Philadelphia	39.22	37.61	36.02	30.40
No. 2 foundry, Chicago	36.00	34.20	33.00	28.50
No. 2 foundry, Valfey	36.50	34.70	33.50	28.50
Southern No. 2 Birmingham	33.38	31.98	29.88	24.80
Southern No. 2, del. Cincinnati	38.25	36.85	34.75	28.90
Malleable, Valley	36.50	34.70	33.50	28.50
Malleable, Chicago	36.50	34.70	33.50	28.50
Charcoal low phos., fob Lyles, Tenn.	44.00	43.80	40.50	33.00
Fermanganese, fob cars, Pittsburgh	140.25	140.25	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	\$39.50	\$37.20	\$30.00	\$20.00
Heavy melt. steel, No. 2, E. Pa.	37.00	38.55	28.35	18.75
Heavy melt. steel, No. 1, Chicago	38.75	39.95	29.25	18.75
Heavy melt. steel, No. 1, Valley	39.00	37.35	31.15	21.00
Heavy melt. steel, No. 1, Cleveland	37.50	37.65	30.75	19.50
Heavy melt. steel, No. 1, Buffalo	39.50	37.90	32.20	19.25
Rails for rerolling, Chicago	46.25	43.20	34.50	22.25
No. 1 cast, Chicago	43.50	41.10	38.50	20.00

Coke

Connellsburg, beehive furnace	\$12.00	11.20	9.125	8.75
Connellsburg, beehive foundry	14.50	13.85	10.375	9.50
Chicago, oven foundry, del.	18.50	17.46	16.10	15.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality \$46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, \$56.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$45-\$50, sales by smaller interests on negotiated basis at \$65 or higher. Detroit, del., \$58; eastern Mich., \$54.

Forging Quality, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$55-\$58; Detroit, del., \$61; eastern Mich., \$62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$66, del. Detroit \$69, eastern Mich., \$70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$60; sales by smaller interests on negotiated basis at \$65 or higher.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.60c-2.65c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, \$69.

Wire Rods: Pittsburgh, Chicago, Birmingham, $\frac{1}{2}$ to $\frac{1}{4}$ -in., inclusive \$2.80-3.05 per 100 lb. Galveston base, \$2.95. Worcester, 2.90c. San Francisco (base del.), \$3.22.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.1c; Phila., del., 3.28c; San Francisco (base del.), 3.63-3.95c; Los Angeles (base, del.), 3.625-3.86c; Seattle, 3.58c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum for Fort Worth, Tex., price or sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.30c; Los Angeles (base, del.), 3.325c; Seattle, 3.88c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base price upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-7.70c; double refined, 8.00-19.75c; Pittsburgh, staybolt, 8.85c-11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.00c; New York, del., 3.08c; Los Angeles (base, del.), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Comshocken, Pa., quotes 3.40c, Sparrows Point equivalent.

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 3.96c; Philadelphia, del., 3.93c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base, 3.85c-3.95c; Granite City, 4.05c; New York, del., 4.24c; Philadelphia, del., 4.15c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, base, 4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc), corrugated 10 cents extra; Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.55c; copper-iron or pure iron, 4.90c. Granite City base prices 10 points higher. Los Angeles (base, del.), 5.24c; San Francisco (base, del.), 5.245c.

Aluminized Sheets: Hot-dipped, coils or cut lengths: Pittsburgh, 7.50c.

Long Terres, No. 10: Pittsburgh, Chicago, Gary, base, 3.85c-4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Cleveland, Youngstown, Middletown, base, 3.95c; Granite City, base, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c. Granite City, Ill., Kokomo, Ind., 4.90c.

Electrical: Pittsburgh, Chicago, Gary, 5.30c. Granite City, Kokomo, 5.40c.

Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c.

Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base del.), 3.60c; Los Angeles (base del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.35c; Chicago, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.35c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.00, 7.15c; over 1.00, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, \$5.75; Granite City, Birmingham, Sparrows Point, \$5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box \$0.25 lb tin, \$4.85; 0.50 lb tin, \$5.05; 0.75 lb tin, \$5.25; Granite City, Birmingham, Sparrows Point, \$4.95 \$5.15, \$5.35 respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.

Manufacturing Terne (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box \$4.90; Granite City, Birmingham, Sparrows Point, \$5.00.

Roofing Terne: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb \$13.50; 15-16 \$15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.15c; Geneva, Utah, 3.10c; New York, del., 3.24c; Phila., del., 3.15c; St. Louis, del., 2.77c; Boston, del., 3.16c; San Francisco and Los Angeles, del., 3.29c-3.46c. (Central Iron & Steel Co., Harrisburg, Pa., 4.15c, basing points.)

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding; Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.00c; Phila., del., 2.94c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c. (Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, \$3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer \$3.55-3.80

Spring (except Birmingham) **\$4.25-**4.50

Wire Products to Trade

Nails

Standard and cement-coated +\$4.25

Galvanized +\$4.00

Staples, polished and galvanized +\$4.25

Wire, Merchant Quality

Annealed (6 to 8 base) +\$4.20

Galvanized (6 to 8 base) +\$4.65

(Fob Pittsburgh, Chicago, Birmingham, per base column)

Woven fence, 15 gage and heavier +\$91

Barbed wire, 80-rod spool +\$101

Barbed wire, twisted 101

Fence posts (no clamps) +\$90

Bale ties, single loop +\$91

* Worcester, \$3.65, Duluth, \$3.60, base, San Francisco (base, del.) \$4.56 for bright basic only.

** Worcester \$4.60, Duluth and Trenton, N. J., \$4.75, base, San Francisco (base, del.) \$5.63 for MB spring wire; \$5.28 black premier.

† Worcester \$4.55, Cleveland \$4.35, base, San Francisco (base, del.) \$5.33.

‡ Duluth \$4.00, Cleveland \$4.10, base, San Francisco (base, del.) \$5.08.

§ Worcester \$4.30, annealed; \$4.75, galvanized. Duluth \$4.20, annealed; \$4.65, galvanized. San Francisco (base, del.) \$5.21, annealed; \$5.66, galvanized.

†† San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, \$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, \$3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse \$55-\$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, \$3.05 per 100 lb, fob mill; \$3.40 base, Seattle; \$3.20, base, Pittsburgh, Calif. Splice bars, \$3.25 per 100 lb, fob mill. Standard spikes, 4.00c-4.50c; screw spikes, 5.80c-6.40c. Axles, 4.10c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about \$200 a net ton. Base discounts Pittsburgh on all sizes; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld

In.	Blk.	Gal.	In.	Blk.	Gal.
$\frac{1}{8}$	46	19 $\frac{1}{2}$	1	56	41 $\frac{1}{2}$
$\frac{1}{4}$	47	25	$\frac{1}{4}$	56 $\frac{1}{2}$	42
$\frac{3}{8}$	44	22	$\frac{1}{2}$	57	42 $\frac{1}{2}$
$\frac{1}{2}$	50 $\frac{1}{2}$	34 $\frac{1}{2}$	2	57 $\frac{1}{2}$	43
$\frac{5}{8}$	53 $\frac{1}{2}$	38 $\frac{1}{2}$	$\frac{1}{2}$ & 3	58	43 $\frac{1}{2}$

In.	Blk.	Gal.	In.	Blk.	Gal.
2	49	34	48 $\frac{1}{2}$	33 $\frac{1}{2}$	48
2 $\frac{1}{2}$ -3	52	37	51 $\frac{1}{2}$	36 $\frac{1}{2}$	51
3 $\frac{1}{2}$ -6	54	39	53 $\frac{1}{2}$	38 $\frac{1}{2}$	53

Line Steel Pipe: Base price in carlots to consumers about \$200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	Elec. Weld	Seamless
W.	Blk.	Gal.	Blk.
2	49	34	48 $\frac{1}{2}$
2 $\frac{1}{2}$ -3	52	37	51 $\frac{1}{2}$
3 $\frac{1}{2}$ -6	54	39	53 $\frac{1}{2}$

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

O.D.	Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled
1"	13	....	\$11.87	\$11.51
1 $\frac{1}{4}$ "	13	....	14.06	14.48
1 $\frac{1}{2}$ "	13	\$13.08	15.69	12.69
1 $\frac{3}{4}$ "	13	....	14.88	17.85
2"	13	....	16.67	19.99
2 $\frac{1}{4}$ "	13	18.58	22.29	18.02
2 $\frac{1}{2}$ "	12	20.47	24.54	19.86
2 $\frac{3}{4}$ "	12	22.42	26.87	21.75
3 $\frac{1}{2}$ "	12	23.76	28.48	23.05
4"	12	24.93	29.90	24.18
5"	11	29.03	34.81	28.16
5 $\frac{1}{2}$ "	11	31.17	37.39	30.23
6"	9	38.69	46.38	37.53
7"	7	51.28	61.50	54.30
8"	9	59.39	71.18	65.00
9"	11	91.18	109.27	96.00

Pipe, Cast Iron: Class B, 6-in. and over \$74.50 per net ton, Birmingham; \$79.50, Burlington, N. J.; \$85.06, del. Chicago; 4-in. pipe, \$5 higher; Class A pipe, \$5 a ton over Class B. Prices effective as of July 24, 1947.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carrige and Machine Bolts
1/2-in. and smaller; up to 6 in. in length 48 off
1/2" and 5/8" x 6-in. and shorter 50 off

Larger diameter; longer than 6 in. 47 off

Tire bolts 38 off
Step bolts 46 off
Plow bolts 57 off

Lag bolts
1/4 in. up to 1 in., 6 in. and shorter 50 off
1/4 in. up to 1 in., longer than 6 in. 48 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

	A.S.	Reg. and Heavy
Semifinished hexagon	51 off	
1/2-in. and smaller		50 off
1/2-in. and 1-in.	48 off	
1/2-in.-1-in.		49 off
1/2-in.-1 1/2-in.	46 off	47 off
1 1/2-in. and larger		40 off
Additional discount of 15 for full containers.		

Hexagon Cap Screws

Upset 1-in. smaller (10-20 bright)	56 off
Upset 10-35 heat treated	51 off
$\frac{5}{8}$ x 6	51 off
$\frac{3}{4}$, $\frac{5}{8}$, & 1 x 6	47 off

Square Head Set Screws

Upset 1-in. and smaller	61 off
Headless, 1/4-in. and larger	46 off
No. 10 and smaller	56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago	
Birmingham	
Structural	5.25c
Lebanon, Pa.	5.40c
1/2-in. and under	55-5 off
Lebanon, Pa.	55-5 off plus 15c per cwt

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, 1c per lb \$1.50-\$2.00 off ft

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W.	Cr	V	Mo	per lb
18.00	4	1	8.5	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	5	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Bars, Drawn	Wire, Structural	Hot Rolled	Cold Rolled
Bars, Drawn			
Wire, Structural			
Grade	Plate	Sheets	Strip
301	26.00c	29.50c	37.00c
302	26.00	29.50	37.00
303	28.50	31.50	39.00
304	27.50	31.50	39.00
308	31.50	37.00	44.50
309	39.00	43.50	51.00
310	53.50	56.50	57.50
316	43.50	48.00	52.00
321	31.50	37.00	44.50
347	36.00	41.50	49.00
431	21.00	24.00	31.50
440A	26.00	31.00	36.50

STRAIGHT CHROMIUM STEEL

403	23.50	27.00	32.00	23.00	29.50
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442	24.50	28.00	35.50	26.00	35.00
443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
*501	9.00	13.00	17.50	13.00	18.50
*502	10.00	14.50	18.50	14.50	19.50

*STAINLESS CLAD STEEL (20%)					
304	24.00	22.00			
410	22.00	20.00			
430	22.50	20.50			
446	29.00	27.00			

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

PIG IRON

Per Gross Ton

	No. 2 Foundry	Basic	Bessemer	Maileable	Price Per Net Ton
Bethlehem, Pa., base	\$37.50	\$37.00	\$38.50	\$38.00	Beehive Ovens
Newark, N. J., del.	39.34	38.84	40.34	39.84	Connellsville, furnace. \$11.50-\$12.50
Brooklyn, N. Y., del.	40.50	...	...	41.00	Connellsville, foundry. 14.00-15.00
Philadelphia, del.	39.22	38.72	40.22	39.72	New River, foundry. 12.50
Birdsboro, Pa., base	40.50	40.00	41.50	41.00	Wise county, foundry. 11.15
Birmingham, base	33.32*	32.88*	...	...	Wise county, furnace. 10.65
Baltimore, del.	39.78	...	...	...
Chicago, del.	37.12	...	...	...
Cincinnati, del.	38.25	...	37.75	...	
Newark, N. J., del.	39.46	...	...	...
Philadelphia, del.	38.84	...	...	...
St. Louis, del.	37.37	...	36.87	...	
Buffalo, base	*36.00	*35.50	37.00	*36.50	Kearney, N. J., ovens. \$17.85
Boston, del.	42.48	41.98	43.48	42.98	Chicago, outside del. 17.50
Rochester, del.	37.84	37.34	38.84	38.34	Chicago, del. 18.50
Syracuse, del.	38.50	38.00	39.50	39.00	Terre Haute, del. 18.05
Canton, Massillon, O., base	36.00	35.50	...	36.50	Milwaukee, ovens. 18.25
Chicago, base	36.00	35.50	37.00	36.50	New England, del. 17.25
Milwaukee, del.	37.32	36.82	38.32	37.83	Birmingham, del. 15.00
Muskegon, Mich., del.	39.83	...	...	40.33	Indianapolis, ovens. 17.00
Cleveland, fob furnace	*36.00	*35.50	37.00	*36.50	Cincinnati, del. 16.50
Akron, del.	37.67	37.17	38.67	38.17	Ironon, O., ovens. 15.50
Duluth, base	36.50	36.00	37.50	37.00	Painesville, ovens. 16.60
Erie, Pa., base	36.00	35.50	37.00	36.50	Cleveland, ovens. 17.90
Everett, Mass., base	45.00	...	...	45.50	Buffalo, del. 18.25
Granite City, Ill., base	37.00	36.50	...	37.00	Detroit, del. 17.65
St. Louis, del.	37.75	37.25	...	37.75	Philadelphia, ovens. 16.75
*Neville Island, Pa., base	36.50	36.00	37.00	36.50	Sweden, Pa., ovens. 16.75
Pittsburgh, del., N. & S. Sides	37.33	36.83	37.83	37.33	Portsmouth, O., ovens. 16.00
Prov, Utah, base	37.50	37.00	...	...	Fairmont, W. Va., ovens. 15.75
Seattle, Tacoma, Wash., del.	41.60	...	...	...	Pittsburgh, del. 17.61
Portland, Oreg., del.	41.60	...	...	...	Old range bessemer. \$5.95
Sharperville, Pa., base	36.50	36.00	37.00	36.50	Old range nonbessemer. 5.80
Steelton, Pa., base	37.50	37.00	38.50	38.00	Mesabi bessemer. 5.70
Struthers, O., base	37.00	36.50	37.50	37.00	Mesabi nonbessemer. 5.55
Swedeland, Pa., base	41.50	41.00	42.50	42.00	High phosphorus. 5.55
Troy, N. Y., base	38.00	37.50	39.00	38.50	
Toledo, O., base	36.00	35.50	37.00	36.50	
Cincinnati, del.	39.50	39.00	...	...
Youngstown, O., base	36.50	36.00	37.00	36.50	
Mansfield, O., del.	39.48	38.98	39.98	39.48	

* To Neville Island base add: 66¢ for McKees Rocks, Pa., \$1.01 for Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa; 97¢ (water), Monongahela; \$1.33, Oakmont, Verona; \$1.49, Brackenridge.

* Republic Steel Corp. quotes \$3 a ton higher at Birmingham, effective Aug. 13; \$7 higher at Buffalo and \$5.25 higher at Cleveland, based on heavy melting steel scrap at those points, and effective on shipments during week ended Aug. 23.

Blast Furnace Slivery Pig Iron

	Gray Forge	
6.00-6.50 per cent (base)	\$45.50	Neville Island, Pa. \$36.00
6.51-7.00	\$46.75	
7.01-7.50	48.00	
7.51-8.00	49.25	Low Phosphorus
8.01-8.50	50.50	Steelton, Pa., Buffalo, Troy, N. Y., \$42.00; Birdsboro, Pa., \$45 base; Philadelphia, \$44.22, del. Intermediate phosphorus, Central furnace, Cleveland, \$39.00.
8.51-9.00	51.75	
Fob Jackson, O., per gross ton; Buffalo base \$1.25 higher. Buyer may use whichever base is more favorable.	58.00	

Bessemer Ferrosilicon

Prices same as for high silicon silicon iron, plus \$1 per gross ton.

Electric Furnace Slivery Pig Iron: \$1.14-1.14-50%, \$66.75, Jackson, O.; \$70, Niagara Falls; \$74, piglets, \$72, open-hearth and foundry grade, Keokuk, Iowa. Add \$1 a ton for each additional 0.5% Si to 18%; 50¢ for each 0.5% Mn over 1%; \$1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn. \$44.00. (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 33 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, \$2 a ton; for each additional 0.25% nickel, \$1 a ton.

HIGH-STRENGTH-LOW ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Point	Buffalo	Bethlehem	Canton	Massillon	Sparrows
Sheets, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	5.30	5.30	...	...	...	...
Galvanized	5.85	...	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...	...
Cold-Rolled	5.10	5.10	5.10	5.10	5.10	5.10	...	...	...	...
Shapes Structural	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Bars, Small Shapes	4.45	4.45	4.45	4.45	4.45	4.45	4.45	4.45	4.45	4.45

Metallurgical Coke

All bases

Malleable Bung Brick

80.00

Silica Brick

79.00

Pennsylvania

79.00

Joliet, E. Chicago

79.00

Birmingham, Ala.

79.00

Magnesite

79.00

Domestic dead-burned grains, net

ton, fob Chewelah, Wash.

Bulk

24.00

Single bags

28.00

Basic Brick

79.00

Net tons, fob Baltimore, Plymouth

Meeting, Chester, Pa.

Chrome brick

59.00

Chem. bonded chrome

59.00

Magnesite brick

81.00

Chem. bonded magnesite

70.00

Ores

Lake Superior Iron Ore

Gross ton, 51 1/2% (Natural)

Lower Lake Ports

Cents, units, del. E. Pa.

15.25

Old range bessemer

\$5.95

Old range nonbessemer

5.80

Mesabi bessemer

5.70

Mesabi nonbessemer

5.55

High phosphorus

5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract

15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.

Nom.

Swedish basic, 60 to 68%.

13.50

Spanish, No. African basic, 50 to 60%.

Nom.

Brazil iron ore, 68-69% fob Rio de Janeiro, nom. 5.50-6.50

100

Tungsten Ore

Wolframite and scheelite per short ton, unit, duty paid

\$32-\$34

Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

100

45-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

100

(S \$ paying for discharge; dry basis, subject to penalties if guarantees are not met.)

100

Indian and African 48% 2.8:1

\$37.50

48% 3:1

39.00

48% no ratio

31.00

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

100

45-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

100

(S \$ paying for discharge; dry basis, subject to penalties if guarantees are not met.)

100

48% 2.8:1 lump

\$33.65

48% 3:1 lump

43.50

Rhodesian

45% no ratio

\$27-\$27.50

48% no ratio

30.00

48% 3:1 lump

39.00

Domestic (seller's nearest rail) 48% 3:1

\$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines

\$0.75

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF₂ content, 70%; or more, \$33; 65% to 70%, \$32; 60% to 65%, \$31; less than 60%, \$30.

100

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS						BARS						PLATES		
	H-R 10G	C-R 10G	C-R 17G	Gal. •10G	Gal. •24G	STRIP	H-R Rds.	C-F Rds.	H-R Alloy (\$4140)	Structural Shapes	Carbon %-%	Flow % & Thickness			
Boston (city)	4.90	5.97 ⁴	5.67 ⁴	6.10 ⁴	7.35 ⁴	4.97	6.71	4.92	5.57	7.17	4.77	5.05	6.72		
†† New York (city)	4.87	6.07	5.77 ⁵	6.07	7.32	4.97	—	4.97	5.52	6.97 ⁹	4.72	5.02	6.70		
New York (country)	4.72	5.92	5.62 ⁸	5.92	7.17	4.82	—	4.82	—	—	4.57	4.87	6.55		
Philadelphia (city)	4.64	6.23 ⁹	5.83 ⁹	5.84	7.09	4.73	5.63	4.78	5.48	6.92 ⁹	4.52	4.79	6.18		
Philadelphia (country)	4.54	6.13 ⁹	5.73 ⁹	—	—	4.63	5.53	4.68	—	6.82 ⁹	4.42	4.69	6.03		
Baltimore (city)	4.29 [†]	5.85 ^{4†}	5.55 ^{4†}	5.54	6.79	4.70	—	4.75	5.45	—	4.64	4.74	6.20		
Baltimore (country)	4.19 [†]	5.75 ^{4†}	5.45 ^{4†}	5.35	6.60	4.60	—	4.65	—	—	4.54	4.64	6.10		
Washington (city)	4.75	—	—	—	—	4.95	—	5.00	5.60 ¹²	—	4.90	4.95	6.60		
Washington (country)	4.65	—	—	—	—	4.85	—	4.90	—	—	4.80	4.85	6.50		
Norfolk, Va.	4.75	—	—	—	—	—	—	5.05	5.85	—	5.00	5.00	5.00		
Memphis, Tenn. (city)	4.82 ⁸⁸	—	5.88	6.37	—	5.02	—	4.97	5.98	—	4.97	5.17	6.88		
Memphis, Tenn. (country)	4.72 ⁸⁸	—	5.78	6.27	—	4.92	—	4.87	5.88	—	4.87	5.07	6.78		
Buffalo (city)	4.45	—	5.20 ⁶	5.90	—	4.60	5.60	4.40	5.10	8.15	4.40	4.85	6.20		
Buffalo (country)	4.30	—	5.05 ⁶	5.75	—	4.45	5.45	4.25	4.95	8.00	4.25	4.70	6.05		
Pittsburgh (city)	4.40 ⁸⁸	—	5.25 ^{4†}	5.65	6.90	4.50	5.50	4.55	5.25	7.05	4.55	4.75	6.10		
Pittsburgh (country)	4.25 ⁸⁸	—	5.10 ^{4†}	5.50	6.75	4.35	5.35	4.40	5.10	6.90	4.40	4.60	5.95		
Cleveland (city)	4.45	5.50 ⁸	5.20 ⁸	5.638	6.888	4.488	5.35	4.40	5.10	6.908	4.611	4.55	6.111		
Cleveland (country)	4.30	5.35 ⁸	5.05 ⁸	—	—	—	5.20	4.25	4.95	—	—	4.40	—		
Cincinnati (city)	4.671	5.516 ⁸	—	5.716	6.466	4.694	—	4.703	5.353	—	4.744	4.903	6.244		
Chicago (city)	4.45	5.50 ⁸	5.20 ⁸	5.65	6.90	4.35	5.35	4.40	5.10	6.65 ¹²	4.40	4.60	6.05		
Chicago (country)	4.30	5.35 ⁸	5.05 ⁸	5.50	6.75	4.20	5.20	4.25	4.95	6.65 ¹²	4.25	4.45	5.90		
Milwaukee	4.599	5.649 ⁸	5.349 ⁸	5.799	7.049	4.499	5.499	4.549	5.249	6.949 ¹²	4.549	4.749	6.199		
St. Louis	4.749	5.799 ⁹	5.499 ⁹	5.974	7.224	4.649	5.774	4.699	5.424 ¹²	7.124	4.699	4.899	6.349		
Birmingham (city)	4.45 ²⁰	—	—	5.80	—	4.45 ²⁰	—	4.40 ²⁰	—	—	4.40	4.65	6.86		
Birmingham (country)	4.30 ²⁰	—	—	5.50	—	4.30 ²⁰	—	4.25 ²⁰	—	—	4.25	4.50	—		
New Orleans	4.98 ²⁰ ⁶⁶	—	6.29 ¹⁸	—	—	5.18 ²⁰	—	5.13 ²⁰ ⁶⁶	6.29 ¹¹	—	5.03 ²⁰ ⁶⁶	5.83 ²⁰	7.29 ²⁰		
Omaha, Nebr.	5.068	—	—	6.468	7.718	5.168	—	5.218	5.918 ¹⁸	—	5.218	5.418	6.868		
Seattle, Tacoma, Wash.	5.30 ¹⁷	—	7.10 ⁵	6.70	—	5.60 ¹⁷	—	5.30 ¹⁷	7.45 ¹⁰	8.50 ¹²	5.25 ¹⁷	5.45	7.55 ¹⁷		

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; ¹—any quantity; ²—300 to 1999 lb; ³—150 to 2249 lb; ⁴—three to 24 bundles; ⁵—450 to 1499 lb; ⁶—one bundle to 1499 lb; ⁷—one to nine bundles; ⁸—400 to 1499 lb; ⁹—1000 to 1999 lb; ¹⁰—450 to 39,999 lb; ¹¹—1000 to 39,999 lb; ¹²—1000 lb and over; ¹³—400 to 14,999 lb; ¹⁴—400 to 39,999; ¹⁵—2000 lb and over; ¹⁶—1000 to 4999; ¹⁷—300 to 9999 lb; ¹⁸—1500 to 1999 lb; ¹⁹—1500 to 39,999; ²⁰—400 to 3999 lb; ²¹—400 lb and over.

[†] Includes gage and coating extra, except Birmingham (coating extra excluded); ^{††} does not include gage extras; [‡] 15 gage; [§] as rolled, except Indianapolis, Los Angeles, San Francisco where price represents annealed bars; ^{**} add 0.46 for sizes not rolled in Birmingham; ^{†††} same prices quoted for Jersey City, N. J.; ^{††††} add 15c for 100 lb for slow moving items; ^{§§} 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegeleisen: 19-21% Mn, 1-3% Si, carlot per gross ton, \$47, Palmerston, Pa., \$51, Pittsburgh, 16% to 19% Mn, \$46, Palmerston, \$50, Pittsburgh.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, \$135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); \$140.25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie-Illinois Steel Corp. is producer); add \$8 for packed c.l., \$1.15 for ton, \$22 for less ton; \$1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.5c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquettes: (Weight approx. 3 lb and containing exactly 2 lb Mn). Prices per lb of briquettes: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, \$2.32; contract, \$2.25; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots \$1.23; smaller lots \$1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots \$1.35; smaller lots \$1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High - Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, \$142.50; 3-5% C, \$157.50.

Ferrovanadium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langstroth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of \$3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferrochrome, Special Foundry: (Cr 62-66%, C above 5-7%). Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots.

Ferrochrome, Briquettes: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquettes, spot prices 0.25c higher; notched 0.25c higher.

Chromium Metal: 97% min. Cr, max, 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb c.l. 80c; central 81c and 82c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 88-90%, Fe 1% max., Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium Metal: cast: Contract, ton lot or more, \$1.60; 100 to 1999 lb, \$1.95; less than 100 lb, \$3.15 per lb of metal, eastern zone; \$1.65, \$1.965 and \$3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrochrome Briquettes: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquettes, spot prices 0.25c higher; notched 0.25c higher.

Chromium Metal: cast: Contract, ton lot or more, \$1.60; 100 to 1999 lb, \$1.95; less than 100 lb, \$3.15 per lb of metal, eastern zone; \$1.65, \$1.965 and \$3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.55c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, east. zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l. 14.10c; 2000 lb to c.l. 15.60c; central, 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about 1/2 lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2 1/2 lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots

5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l. 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more; Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1 1/2c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots \$1.89, less \$2.01, eastern, freight allowed; \$1.903 and \$2.023, central; \$1.935 and \$2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni balance). Prices per lb of alloy: Contract, 5 tons or more \$1.90, 1 ton to 5 tons \$2.00, smaller lots \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; \$6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbont: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Sileaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zn 5-7%, Ti 9-11% and Fe 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Prices per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

CMSZ Alloys 4 & 5: (Alloy 4—Cr 45-59%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern,

freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, carlots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c; spot up 0.25c.

Zirconium alloy: Z 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb carlots 6.50c, ton lots packed, 7.00c; 200 to 1999 lb, 7.75c; smaller lots, 8.25c. Spot up 1/2c.

Smalman: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 98.8%, \$3.05, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all for Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89.92% V₂O₅ and 5.84% Na₂O; or air dried, 83.85% V₂O₅ and 5.15% Na₂O, \$1.10 per lb contained V₂O₅, fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Government Plans Heavier Purchases of Metals

High prices will be resisted and purchases will be limited to materials in good supply... Primary markets firm

not fear a shortage of zinc. Prices held unchanged last week at 10.50c, East St. Louis, for prime western.

TIN — Combined Tin Committee, reporting last week that world tin supplies will meet only half the demand in the last half of this year, announced a new allocation plan for the period. The interim allocation of 15,710 long tons is in addition to a previous allocation of 11,331 tons on July 8.

"Together, these total 27,041 tons and represent nearly all the tin that can be expected to be available during the remainder of 1947," said the committee which is made up of representatives of the United States, Great Britain, Canada, France, Belgium, the Netherlands, China and India. The United States was granted about one half of the entire new allocation, bringing its quota for the half year to 14,657 tons.

The Bolivian government has threatened to take "decisive action" against the Patino Mines Co. if it persists in refusing to attend proposed government-labor-management negotiations to solve its labor controversies. Government authorization was given the company recently to dismiss 5000 tin miners in the Catavi and Llallagua districts on the understanding that 95 per cent of them would be rehired automatically and that only agitators blamed for recent labor troubles would be fired. A deadlock has resulted between the company and the miners' union because of the union's insistence that the old wage-increase demands be met before any miners are dismissed.

A strike by the Chinese coolies at Billiton has ended and full operations

have been resumed to the extent of present equipment. Billiton's production had been running at a little over 600 tons a month before the strike started in early May, dropping to 206 tons in May and only 154 tons in June.

Banka's production may be affected this month due to shortage of coal caused by interruption in the movement of coal from Sumatra.

In Malaya, tin production was equivalent to 2261 tons of fine tin in June, making a total of 6080 tons for the second quarter of which 3514 tons were obtained by dredging and 1868 tons by gravel pumping. The number of mines operated increased from 295 at the end of April to 370 at the end of June. Dredging increased from 29 to 42 and gravel pumping from 169 to 218.

In July, 715 tons of tin were shipped from Singapore and 2740 tons from Penang. The United States received 3150 tons of this 3455 ton total.

ALUMINUM — Production of aluminum in May totaled 51,116 short tons, or an increase of about 1 per cent over the average for the preceding five months and representing virtual capacity operations of reduction plants for which power was available, according to the Bureau of Mines. Demand dropped off markedly, especially for rolled products, with curtailment in operation at some rolling mills and temporary suspension planned for one primary metal plant. Consumers appeared to be well stocked and restricted purchases to needs for current consumption. As a consequence, producers' stocks of virgin metal jumped to 64,053 tons, or, slightly more than 50 per cent.

Allocations and deliveries from Office of Metals Reserve stocks were discontinued.

SILVER — Handy & Harman's "official" price of silver advanced rather sharply last week to 67.75c an ounce. Strength was attributed to scarcity of foreign supplies to meet normal demand from domestic consumers.

COPPER — Refiners have advanced their buying prices for red metal scrap 1/4 to 1/2-cent to the basis of 18.25c to 18.50c for No. 1 copper. Trading in this material has been rather quiet, however. During the first seven months of this year, production of copper from scrap averaged 9000 tons a month against less than 3600 tons a month in 1946.

The primary copper market remains quiet also with prices holding steady at 21.50c, delivered Connecticut Valley, for electrolytic and 21.50c, fob New York, for export copper.

LEAD — Demand for primary lead continues active, although bookings are limited to daily quotas of producers. Majority of the consumers are receiving sufficient tonnages to cover their needs. According to Clinton H. Crane, chairman, St. Joseph Lead Co., overall consumption and supply of lead are now about in balance. Prices were unchanged last week on the basis of 14.80c to 14.85c, St. Louis, for the common grade.

ZINC — Termination of the Premium Price Plan and the accompanying prospect of smaller production in some districts failed to stimulate buying interest, confirming the belief that consumers do

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62 1/4c, del. Conn. Dealers may add 3/4c for 5000 lb to carload; 1c, 1000-4999 lb; 1 1/2c, 500-999 lb; 2c, 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingots: 85-5-5-5 (No. 115) 19.00c; 88-10-2 (No. 215) 27.25c; 80-10-10 (No. 305) 23.00c; No. 1 yellow (No. 405) 15.25c; carlot prices, including 25c per 100 lb freight allowance; add 1/4c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add 3/4c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 13.75c; No. 12 foundry alloy (No. 2 grade) 13.25-13.75c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1 (95.97%-98%) 14.50c; grade 2 (92-95%) 12.75c; grade 3 (90-92%) 12.00-12.25c; grade 4 (85-90%) 11.50-11.75c. Above prices for 30,000 lb or more; add 3/4c 10,000-30,000 lb; 1/2c 5000-10,000 lb; 1/4c 1000-5000 lb; 1/4c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1 1/2c 1000-2239, 2 1/2c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl., 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99.49% incl., 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add 1/4c for less than carload to 10,000 lb; 1/2c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add 1/2c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, \$84-\$87 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, \$17 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms \$1.75 lb. del.; anodes, balls, dics and all other special or patented shapes, \$1.80.

Cobalt: 97-98%, \$1.65 lb for 550 lb (keg); \$1.67 lb for 1000 lb (case); \$1.72 lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Indium: 99.9%, \$2.25 per troy ounce.

Silver: Open market, N. Y., 67.75c, per ounce.

Platinum: \$53-\$56 per ounce.

Palladium: \$24 per troy ounce.

Iridium: \$80-\$90 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c; red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 33.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 32.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

Copper Wire: Bare, soft, fob eastern mills, carlots 27.72c, less carlots 28.22c; weather-proof, fob eastern mills carlots 28.12c, less carlots 28.62c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicate maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S.	Max. Width Gage or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chrome Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electro-deposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c/kg.

Sodium Cyanide: 96-98%, 1/2-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb, 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbl, price on application.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.

To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.

To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metal

BRASS MILL ALLOWANCE

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add 3/4c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS
BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.50, No. 2 copper 16.50, light copper 15.50, composition red brass 13.25, auto radiators 10.25, heavy yellow brass 9.50, brass pipe 9.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.25-18.50, No. 2 copper, 17.25-17.50, light copper, 16.25-16.50, refinery brass (60% copper), per dry copper content less \$5 smelting charge for brass analyzing 60 per cent or more, 14.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.00-16.50, No. 2 15.00, light copper 14.00; No. 1 composition red brass 12.00-12.25, No. 1 composition turnings 11.50-11.75, mixed brass turnings 7.00, new brass clippings 12.00-12.50, No. 1 brass rod turnings 10.50-11.00, light brass 6.00, heavy yellow brass 7.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 9.00c, cocks and faucets 9.00-9.50, brass pipe 9.00.

Lead: Heavy 11.50-12.00, battery plates 7.00, linotype and stereotype 12.25-12.50, electrotypes 10.75-11.00, mixed babbitt 12.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.00-5.50, new die cast scrap 3.75-4.00, old die cast scrap 3.00.

Tin: No. 1 pewter 50.00-52.00, block tin 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 7.50-8.00, old sheets 6.00, crankcases 6.00, borings and turnings 2.00, pistons, free of struts, 5.00.

Nickel: Anodes 18.50-19.00, turnings 15.50-16.50, rod ends 18.00-19.00.

Monel: Clippings 13.00-14.00, turnings 7.50-8.00, old sheet 11.00-12.00, rods 11.50-12.50, castings 9.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

CINCINNATI	
No. 1 Heavy Melt. Steel	\$38.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Busheling	38.00
Nos. 1, 2 and 3 Bundles	38.00
Mach. Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.00-33.50
Short Shovel Turnings	35.00-35.50
Cast Iron Borings	33.50-34.00
Bar Crops and Plate	45.50-46.50
Low Phos. Steel	45.50-46.50
Punchings & Plate Scrap	46.50-47.50
Cut Structural	44.50-45.50
Elec. Furnace Bundles	43.50-44.50
Heavy Turnings	36.50-37.50

Cast Iron Grades

RAILROAD SCRAP	
No. 1 Cupola	40.50-41.50
Charging Box Cast	40.50-41.50
Heavy Breakable Cast	35.50-36.50
Stove Plate	34.50-35.50
Unstripped Motor Blocks	38.00-39.00
Malleable	49.00-50.00
Brake Shoes	35.00-36.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	42.00-42.50
Burnt Cast	32.00-33.00

*Brokers buying prices.

CLEVELAND

RAILROAD SCRAP	
No. 1 Heavy Melt. Steel	\$37.00-38.00
No. 2 Heavy Melt. Steel	37.00-38.00
No. 1 Busheling	37.00-38.00
Nos. 1 & 2 Bundles	37.00-38.00
Mach. Shop Turnings	31.00-31.50
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings	32.00-32.50
Cast Iron Borings	32.00-32.50
Bar Crops and Plate	42.00-42.50
Cast Steel	46.00-47.00
Punchings & Plate Scrap	42.00-42.50
Heavy Turnings	37.00-37.50
Alloy Free Turnings	33.00-33.50
Cut Structural	42.00-42.50

Cast Iron Grades

RAILROAD SCRAP	
No. 1 Cupola	45.00-46.00
Charging Box Cast	43.00-44.00
Stove Plate	42.00-43.00
Heavy Breakable Cast	41.00-42.00
Unstripped Motor Blocks	41.00-42.00
Malleable	56.00-57.00
Brake Shoes	42.00
Clean Auto Cast	50.00
No. 1 Wheels	45.00
Burnt Cast	42.00-43.00

RAILROAD SCRAP

RAILROAD SCRAP	
No. 1 R.R. Heavy Melt.	39.50
R.R. Malleable	56.00-57.00
Rails, Rerolling	44.00-45.00
Rails, Random Lengths	44.00-45.00
Rails, 3 ft and under	48.00-49.00
Railroad Specialties	48.00-50.00
Uncut Tires	45.00-46.00
Angles, Splice Bars	49.00

VALLEY

RAILROAD SCRAP	
No. 1 Heavy Melt. Steel	\$38.00-40.00
No. 2 Heavy Melt. Steel	38.00-40.00
No. 1 Bundles	38.00-40.00
Mach. Shop Turnings	34.00-35.00
Short Shovel Turnings	35.00-36.00
Cast Iron Borings	35.00-36.00
Low Phos.	44.00-45.00

RAILROAD SCRAP

RAILROAD SCRAP	
No. 1 R.R. Heavy Melt.	43.00-44.00

MANSFIELD

RAILROAD SCRAP	
No. 1 Heavy Melt. Steel	\$40.00

RAILROAD SCRAP	
Mach. Shop Turnings	35.00

RAILROAD SCRAP	
Short Shovel Turnings	36.00-37.00

CINCINNATI

RAILROAD SCRAP	
No. 1 Cupola Cast	47.00
Charging Box Cast	39.00
Heavy Breakable Cast	40.00
Stove Plate	38.00
Unstripped Motor Blocks	41.00
Brake Shoes	37.00
Clean Auto Cast	46.00
Drop Broken Cast	50.00

CAST IRON GRADES

RAILROAD SCRAP	
No. 1 R.R. Heavy Melt.	42.00
R.R. Malleable	56.00
Rails, Rerolling	45.00
Rails, Random Lengths	45.00
Rails, 3 ft and under	46.00
Railroad specialties	47.50-48.00
Uncut Tires	46.00-46.50
Angles, Splice Bars	46.00-47.00

DETROIT

(Dealers buying prices, fob shipping point)	
No. 1 Heavy Melt. Steel	\$34.50-35.00
No. 1 Busheling	34.50-35.00
Nos. 1 & 2 Bundles	34.50-35.00
No. 3 Bundles	34.50-35.00
Machine Shop Turnings	27.50-28.00
Mixed Borings, Turnings	27.50-28.00
Short Shovel Turnings	28.50-29.00
Cast Iron Borings	28.50-29.00
Punchings & Plate Scrap	39.00-39.50

CAST IRON GRADES

RAILROAD SCRAP	
No. 1 Cupola Cast	39.00-40.00
Heavy Breakable Cast	33.00-34.00
Clean Auto Cast	39.00-40.00

BUFFALO

RAILROAD SCRAP	
No. 1 Heavy Melt. Steel	\$39.00-40.00
No. 2 Heavy Melt. Steel	39.00-40.00
No. 1 Busheling	39.00-40.00
Nos. 1 & 2 Bundles	39.00-40.00
No. 3 Bundles	39.00-40.00
Machine Shop Turnings	33.00-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings	35.00-36.00
Cast Iron Borings	34.50-35.00
Mixed Borings, Turnings	30.00-31.00
Cast Iron Borings	30.00-31.00
Short Shovel Turnings	32.00-33.00
Low phos.	42.00-43.00

CAST IRON GRADES

RAILROAD SCRAP	
No. 1 Cupola Cast	40.00-42.00
Heavy Breakable Cast	38.00-40.00
Malleable	50.00-52.00
No. 1 Wheels	42.00-43.00

RAILROAD SCRAP

RAILROAD SCRAP	
Rails, 2 ft and under	45.00-47.00
Railroad Specialties	45.00-46.00
No. 1 Heavy Melt. Steel	38.00-39.00
No. 2 Heavy Melt. Steel	38.00-39.00
No. 1 Busheling	38.00-39.00
Nos. 1 & 2 Bundles	38.00-39.00
No. 3 Bundles	38.00-39.00
Machine Shop Turnings	33.00-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings	35.00-36.00
Cast Iron Borings	34.50-35.00
Angles, Splice Bars	34.00-35.00

RAILROAD SCRAP

RAILROAD SCRAP	
No. 1 Heavy Melt. Steel	\$36.50-37.50
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	36.00
Nos. 1 & 2 Bundles	36.00
No. 3 Bundles	36.00
Machine Shop Turnings	24.00-25.00
Mixed Borings, Turnings	24.00-25.00
Short Shovel Turnings	26.00-27.00
Punchings & Plate Scrap	34.00-35.00
Cut Structural	33.00-35.00
Elec. Furnace Bundles	33.00
Cast Iron Borings	31.00

RAILROAD SCRAP

RAILROAD SCRAP	
No. 1 Heavy Melt. Steel	\$36.00
No. 2 Heavy Melt. Steel	36.00
No. 1 Busheling	36.00
Nos. 1 & 2 Bundles	36.00
No. 3 Bundles	36.00
Machine Shop Turnings	24.00-25.00
Mixed Borings, Turnings	24.00-25.00
Short Shovel Turnings	26.00-27.00
Punchings & Plate Scrap	34.00-35.00
Cut Structural	33.00-35.00
Elec. Furnace Bundles	33.00
Cast Iron Borings	31.00

RAILROAD SCRAP

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No. 2 Heavy Melt. Steel	36.00
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No. 3 Bundles	36.00
Machine Shop Turnings	24.00-25.00
Mixed Borings, Turnings	24.00-25.00
Short Shovel Turnings	26.00-27.00
Punchings & Plate Scrap	34.00-35.00
Cut Structural	33.00-35.00
Elec. Furnace Bundles	33.00
Cast Iron Borings	31.00

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Cut Structural	33.00-35.00
Elec. Furnace Bundles	33.00
Cast Iron Borings	31.00

RAILROAD SCRAP

Sheets, Strip . . .

One producer planning to set up quotas on a monthly instead of a quarterly basis

Sheet Prices, Page 138

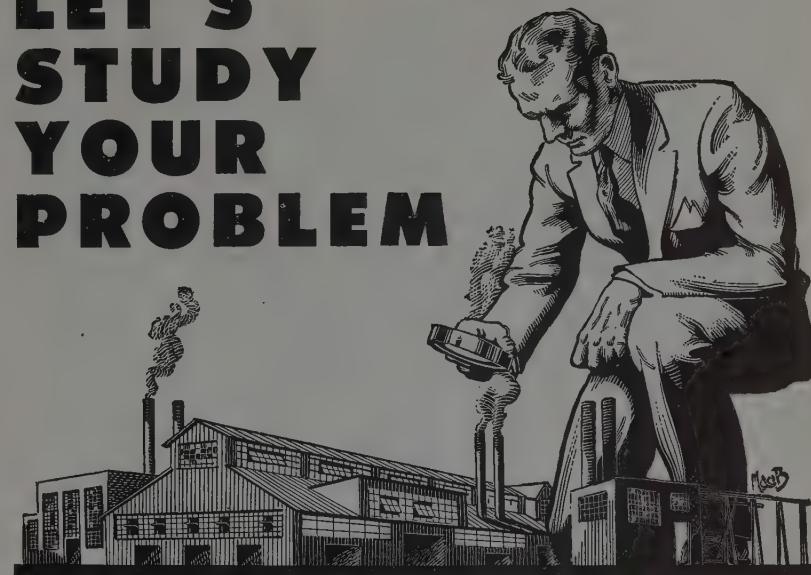
New York—One producer of silicon sheets is setting up quotas for the last three months of the year on a month-to-month basis instead of a quarterly basis. In other words, this interest is quoting only for October, with allotments for November and December to come along later as the season advances. This action is ascribed in part as due to the possibility that facilities may be increased somewhat before the end of the year, although this is not as yet certain. Otherwise, the situation in sheets is much the same as recently indicated, with no improvement in quotas for the fourth quarter and in some instances rather sharp reductions. Cold-rolled, galvanized and silicon sheets remain in particularly stringent supply, with consumers unable to count on nearly as much as they would like to have. Only in stainless steel sheets, in fact, does supply appear at all easy and in that grade some sellers are able to make deliveries within five weeks.

Boston—Of flat-rolled carbon steel products, only narrow cold-rolled strip gives any signs of easing and even in that commodity the trend is not too general. With shipments now in excess of new orders, some cold strip units are cutting into backlog deeper and have some capacity open for December scheduling. Slackening in pressure for strip indicates an improvement in inventories and, in spots, lack of components to match strip for the fabrication of finished goods. A few users are slower in taking up fourth quarter allotments and indicate they are less pressed for material for that period. Dual prices, 3.75c and 3.90c, Worcester, plague some users; extent of the recent increase in prices is not uniform. Consumers of hot-rolled carbon and galvanized sheets will be pinched for material through fourth quarter, although cold-rolled may be slightly freer. Notably hard pressed for steel are builders of household fuel tanks, requiring No. 12 and 14 gage stock.

Pittsburgh—Consumers continue to press for shipments and no relief in the tight supply situation is in sight. Indications are a strong demand will be encountered indefinitely into the future barring unexpected developments. The higher prices recently effected have had virtually no repercussion on demand unless it is that some grumbling has come from consumers to the effect the higher prices have not resulted in one iota of change in supply conditions. When production of sheets will catch up with demand is uncertain but the best views in the market here are that approximate supply-demand balance is unlikely before well into 1948 at earliest. While much new flat-rolling capacity is scheduled to come into operation over coming months the chances are this will have no material influence on the situation until early next year at best.

Chicago—The sheet and strip situation here continues unchanged insofar as supply and demand are concerned. Producers are receiving specifications from customers at a rate exceeding production and there are no indications that the pattern will change any time soon.

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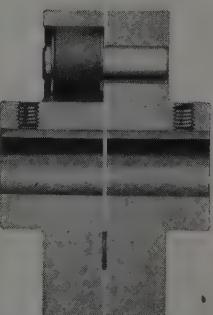
Positive, resilient drive . . . rubber-bushed . . . oilless bronze bearings mating with 3 drive studs provide protection against unavoidable misalignment.

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no objectionable backlash.

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Although output is at maximum of semi-finished allocation, no headway is being made in reducing backlog and carry-over tonnage from third to fourth quarter will be heavy. Independents continue to post prices which are \$1 to \$2 higher than those quoted by bigger interests, but this has resulted in no important protests and is not likely to so long as availability of material stands ahead of price considerations.

Cincinnati—District sheet mills are standing pat on the policy of making up allotments and schedules quarter by quarter. Without commitments, the demand and supply conditions after the first of the year are not yet discernible, although opinion is freely expressed that the market will continue tight. For the fourth quarter, it is apparent that regular customers will get little, if any, more tonnage. Current operations are being pushed to trim the carryover to a minimum.

Birmingham—No easing in demand for sheets is noted in this district. Pressure is not as great as it was a few months ago since sheet processors have discovered it is inevitable that they become reconciled to the unbalanced supply situation. Recent price markups apparently have had no effect on the situation.

St. Louis—Finished flat steel shipments are improving and operations have edged up to 80 per cent of capacity as compared to 70 per cent a month ago. Shipments have been poor recently due to pipeline-filling delays following strikes at Granite City Steel Co. Fourth quarter production and shipments, however, are expected to be the best in history, with operations at 100 per cent. Granite City plans to open its books next month and be abreast of backlogged orders by Jan. 1. There may be a limited carryover. The firm has accepted no orders for nearly a year, trying to get current.

Demand is showing no signs of easing, however, and railroad car builders are putting on pressure for the allocated steel deliveries they formerly weren't ready to accept. Carmakers here are generally regarded in fair position on steel. Granite City Steel, formerly hampered by an iron quota of 60 per cent of its previous consumption, now is getting all it needs. The pig-scrap ratio at one time was down to 16-84 per cent but now ranges up to 38-62 per cent, enabling the company to conserve scrap and reduce costs slightly.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 138

Chicago—Committed beyond the tonnage of reinforcing steel allocated to them by mills, suppliers are consistently declining to estimate and submit bids on new construction projects coming out for bids. Jobs requiring only a few tons each command more attention than those involving several hundred tons. As a result of this situation, plus the fact that construction bids are frequently far above estimates, a considerable number of projects are withdrawn or delayed indefinitely.

Seattle—Higher prices have not diminished demand for merchant and reinforcing bars. Local mills have ample order backlog which they are trying to reduce. Northwest Steel Rolling Mills' electric furnace is closed for repairs for a week and lack of ingots may slow the rolling mill. No new orders are being booked meanwhile. Several large ton-

ngages are soon to be in the market, including a sizable order for the Hanford project and several major construction jobs at University of Washington and in eastern Washington. Many small tonnages are being offered but mills cannot meet present demands.

Bethlehem Pacific Coast Steel Co., Seattle, has taken 315 tons for the administration building and 90 tons for the University of Washington library. The Narrows bridge, bids Oct. 15, involves 848 tons reinforcing. Washington state has awarded two bridge jobs in eastern Washington, involving about 200 tons and bids are called Sept. 3 for highway projects requiring 200 tons or more.

Steel Bars . . .

Timken advances hot-rolled bar prices \$5, cold-finished \$6 a ton

Bar Prices, Page 138

Boston — Although the bulk of carbon bar tonnage moves into New England on a Buffalo base and will continue to do so, an increasing volume in sizes and grades not rolled at that point is being based at Ohio producing centers, adding to the extent of higher freights to the delivered price. This stands to affect the warehouse trade more next quarter and, to a mild extent, some manufacturing costs. There is slackening in buying for some type of bars, but the bulk of demand centers in light hot-rolled carbon. Most producers, still allocating, are not increasing fourth quarter allotments.

Some further revisions in extras, overhauled drastically earlier, may be expected. Except for flats and smaller rounds, cold-finished bars are getting into balance with requirements. Alloy buying is slow; there are no price changes on some grades, while changes in several heat-treated alloys represent a reduction. Antifriction bearing users of 52,100 alloy bars, including Connecticut shops which take a substantial tonnage of that grade, are confronted with higher steel costs. \$5 a ton for hot-rolled and \$6 cold-finished.

New York—Except in cold-drawn carbon and alloy, bar sellers are virtually booked up over the remainder of the year. Some tonnage is still available in the large carbon rounds but this is the exception. Producers state that not only are they definitely sold out on the small sizes, but the medium sizes as well. However, some trade observers still believe there will be some loosening up on the medium sizes before the year is over.

On cold-drawn carbon bars, most sellers can work in tonnages for fourth quarter on all sizes except the very smallest and even some of that tonnage is still available, it is claimed. Hot and cold alloy bars can be had generally for shipment in a few weeks.

Chicago — Smaller sizes of carbon bars and bar shapes are urgently sought after by consumers in every industry. Demand shows no signs of easing in the foreseeable future. Despite the fact that sheets and strip are the principal bottleneck in manufacturing operations in many plants. Larger sizes of carbon bars are somewhat easier in supply, and alloys are quite free.

Canton, O.—Timken Roller Bearing Co. has increased base prices on steel



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- 1 Stress relieving of large castings such as motor blocks.
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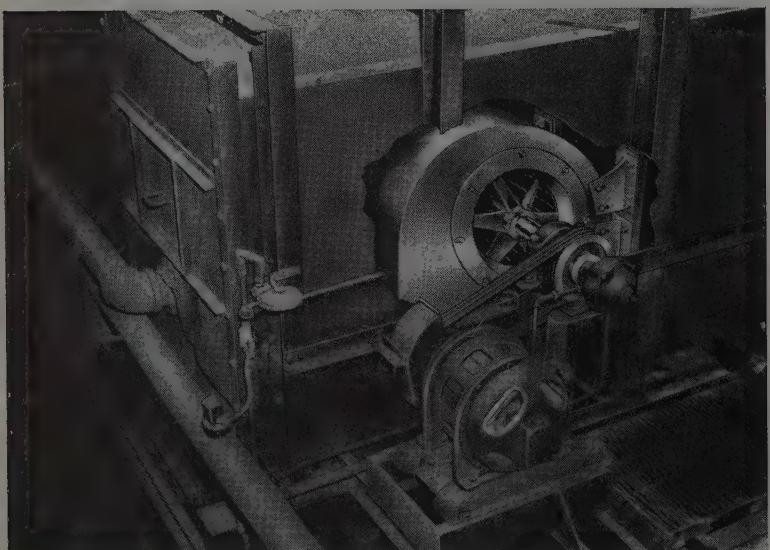
MICHIANA High Temperature Fans have been successfully operating to recirculate high temperature air for such and similar purposes.

These Fans are proof against usual distortions and unbalanced conditions. There are no screws, bolts, rivets or welds used in their construction. The vital parts are so assembled that they are free to expand and contract independently of each other radially and axially. By this means, distortion is avoided and the fan wheel remains in balance.

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MICHIANA HIGH TEMPERATURE, RECIRCULATING FANS

Bulletin
645



Single Inlet Wheel, showing closed end and shaft

bars \$5 a ton on hot-rolled and \$6 a ton on cold-finished products, effective on shipments starting Aug. 18. The company's prices on bearing quality alloy steel mechanical tubing have been increased 5 per cent, with increases ranging from 4 to 10 per cent on other grades of mechanical and pressure tubing.

Plates . . .

Tonnage available for export restricted by individual licensing system

Plate Prices, Page 139

New York — Individual licensing on plates for export, a system which has been in effect on that product for some weeks, on tin plate all along and recently has been extended to most other iron and steel products, effective Oct. 1, is resulting in some cancellation of plate tonnage for shipment abroad. Difficulty in getting the individual licenses, supplying all the information needed for these licenses and in meeting the requirements now necessary has caused some orders placed earlier in the year to be wiped off the books.

Some producers look for this trend to continue for a while, although admitting that once the situation becomes adjusted to the individual licensing system volume might be restored. They believe that at least there will be outlets for as much tonnage as the government export quotas will provide. For the current quarter, for instance, a quota of 100,000 tons of plates was set up, although actually applications were filed for 250,000 tons. The overall quota for the fourth quarter, once it is named, probably will be about the same.

Space provided by such tonnage as is now being cancelled probably will be diverted to domestic orders, although relief will not be appreciable; it may not even be applied to new orders in most cases, but rather to arrearages.

Boston — Railroad car-building shops account for a substantial slice of plate production with deliveries in most cases in excess of current consumption. For new tonnage, several plate mills are out of the market through fourth quarter and others are selective in the acceptance of orders in filling schedule openings. This selectivity in taking orders has resulted in the upgrading of considerable fabricated plate work; shops, unable to buy carbon grades in wanted sizes, have substituted low-carbon high-tensile alloy at higher cost.

Philadelphia — While some export orders are being cancelled by plate producers because of uncertainty as to licenses, schedules thus released are being diverted principally to domestic arrearages rather than to new orders. Relief, however, is relatively small considering size of mill order backlog. Producers have little capacity available for remainder of the year with due allowance for certain quotas to be filled in later.

Sun Shipbuilding & Dry Dock Co., Chester, Pa., has been awarded a contract for construction of a seagoing hopper dredge for Army on a bid of \$9,619,750. This builder was noted in STEEL some time ago as low bidder, with dredge requiring approximately 6500 tons of steel. Babcock & Wilcox Co., New York, has been awarded the con-

tract for boilers on a bid of \$41,000.

Birmingham — A considerable carry-over of orders into the fourth quarter is indicated in plates in this district. Result, of course, is a further limiting of allocations. Plate users are viewing the overall situation with considerable anxiety due to the apparent long range need for plates. Announcement by Republic Steel Corp. of a tube mill at Gadsden might further complicate the plate situation, it is believed, although that is an eventuality for next year.

Seattle — No important projects involving plates are up for immediate attention but local plants report fair backlogs and nearly capacity operations with numerous small contracts for tanks and boilers.

Hillsboro, Oreg., has called bids Aug. 25 for installation of 26,150 feet of 18-inch steel water supply pipe, the last unit of a 20-mile project. Beall Tank & Pipe Co., Portland, Oreg., is fabricating 600 tons or more for this job.

Tubular Goods . . .

Tubular Goods Prices, Page 139

Pittsburgh—Pipe and tubular goods demand is unchanged with pressure for deliveries coming in from all directions. New list of discounts is taking hold, the higher prices being accepted without question by consumers. New list of base prices on boiler tubes, issued by Babcock & Wilcox, include the following: One-inch outside diameter, 13 gage, seamless, cold-drawn \$11.87 per 100 feet, f.o.b. Pittsburgh in carload lots, cut lengths 4 feet to 24 feet, inclusive; electric welded, hot-rolled and cold drawn, \$11.51;

2 inch, seamless, hot-rolled \$16.67, cold-drawn \$19.99; electric welded, hot-rolled \$16.17, cold-drawn \$19.39;

3 inch, 12 gage, seamless, hot-rolled \$24.93, cold-drawn \$29.90; electric-welded, hot-rolled \$24.18, cold-drawn \$29;

4 inch, 10 gage, seamless, hot-rolled \$38.69, cold-drawn \$46.38; electric welded, hot-rolled \$37.53, cold-drawn \$44.99.

Boston — Merchant steel pipe distributors are generally getting pipe quotas each month, but no more, although pressure is steady for an increase in allotments. Although demand is in excess of supply, most mills normally shipping tubular products based at Pittsburgh to this territory continue to deliver some tonnage. Several who withdrew on some products months ago, maintain pipe shipments. Distributors of mechanical and pressure tubing have followed mill price advances which range from four to 10 per cent; increase to producers of antifriction bearings, extensive users of 52,000 alloy mechanical tubing, is five per cent. Cast iron pipe is up \$3.50 a ton, reflecting higher pig iron and scrap costs.

New York — Pipe line producers are expecting to receive inquiries shortly for a 500-mile pipe line for the Shell Union Oil Corp. and the Texas Co. to transport crude oil from the Cushing, Okla., fields to the Wood River and Salem, Ill., refineries. Pipe will be of 16 and 20-inch diameter.

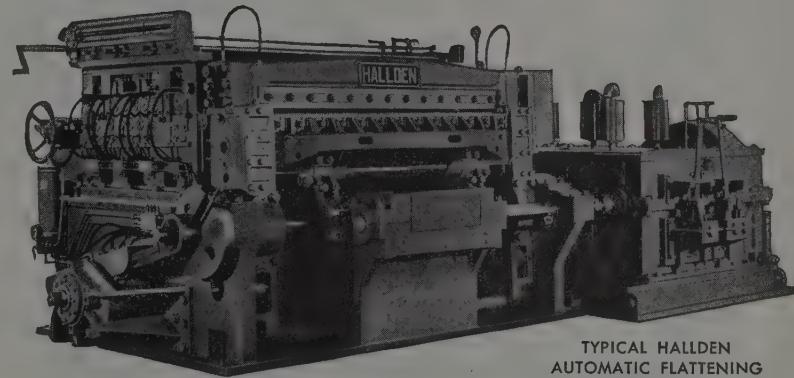
Seattle — The cast iron pipe market is experiencing a seasonal recession due in some measure to the difficulty in obtaining supplies. However, there is a strong potential demand which is expected to

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AUTOMATIC FLATTENING
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CONTINUOUS FEED . . . The flattener and shear are driven in combination and synchronized so that during the cutting operation the shear moves with the exact speed of the metal, eliminating any interruption in the passing of the strip through the machine.

MINIMUM MAINTENANCE . . . The rolls of the flattener are constructed of alloy chrome steel hardened and ground to a scleroscope of 90, and are easily removed for grinding. The flying shear is a rocker type guillotine design of special alloy welded steel with interchangeable blades. The Hallden Shear is a simple, heavy, rugged machine requiring a minimum amount of maintenance other than oiling under continuous normal operation.

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SALES REPRESENTATIVES

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bring many sizable projects out for figures in the near future.

Bertha water district, Portland, Oreg., reports J. T. McDermit, Oswego, low at \$24,854 for construction of a reinforced water reservoir and Pacific Waterworks Supply Co., Portland, low \$19,499 for furnishing 19,000 ft 6 inch 10 gage steel water pipe.

Wire . . .

Wire Prices, Page 139

Boston — With incoming orders lower, wire mills are making more inroads on backlog with improved deliveries on a broader range of high carbon products. Pressure from the automobile industry for valve spring and other types of wire

has eased and an increasing number of consumers have better rounded inventories; music wire can be shipped from stock in some cases. There is also an improvement in overall rod supply. Some producers have not revised prices and one Worcester mill drawing bobby pin wire has reduced price for that grade \$1 a ton. Variance in prices and extras is confusing to buyers. No bids were received for 46,230 coils of barbed wire wanted by chief of engineers, Army, recently.

Chicago — Demand for wire products for third quarter is running well above current production, and indications are that a similar situation will prevail during fourth quarter. Abnormal conditions of weather, including excessive rains, floods and extended periods of above-

average heat, have compounded the demands for merchant products. Floods have increased requirements for replacement fencing and a bumper hay crop prematurely matured by the heat has caused a run on bale ties and wire.

Birmingham — Demand for wire products continues strong. Merchant wire demand remains heavy throughout the year, but the need for wire fencing, nails and similar items is being largely influenced by weather conditions with the result that agricultural needs are accentuated. Jobbers see no real relief in the early future.

Structural Shapes . . .

Shortage of structurals forces changes in specifications to concrete reinforcing

Structural Shape Prices Page 139

Philadelphia — While a few fair sized tonnages have been placed, structural inquiry here is small, with projects involving less than 100 tons each in most instances. However, district fabricators in general have several months' work on hand and complain of inability to get sufficient steel to keep operating at capacity. About 1800 tons of structural steel have been withdrawn from the market by virtue of the decision to erect Our Lady of Lourdes hospital, Camden, N. J., of reinforcing steel, for which George A. Fuller Co., New York, has the general contract.

New York — Although various sizable projects are in prospect, most are still in the inactive stage and, as for the smaller work, there is a general lag. However, recent inquiry includes two apartment houses, requiring 500 and 1200 tons, respectively, and a fair amount of school work.

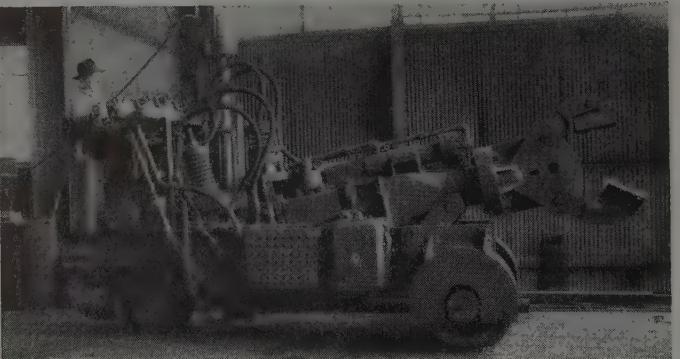
As a result of recent bids submitted by general contractors, it appears that the Lillian Wald housing project, Manhattan, will be erected of reinforcing steel if the project does go ahead. This eliminates about 7500 tons of structural steel from the prospective list. Charles Meyer, architect, 81 Union Square, is preparing plans for \$11 million replacements, including equipment, at the Metropolitan Hospital at 97th to 99th Sts, between First and Second Aves.

Boston — In the absence of bridge and public works inquiry, new volume in fabricated structural steel is dwindling. Contracts placed here include 500 tons for a power plant, Beaumont, Tex. Large shops' order backlog are extended well through first quarter next year, but smaller units have openings within that period. Despite the slump in new bookings, availability of plain material in required range of sizes is the major problem; this affects delivery of fabricated tonnage and limits bookings by most shops. Component parts for Bailey bridges, 5660 tons, are offered for sale by War Assets Administration, Sept. 9, material being located at Belle Mead, N. J., Albany and Voorheesville, N. Y. no complete bridges are included.

Until further notice, contractors are exempt from payment of the state sales and use tax for steel and other materials actually incorporated into projects for the Connecticut highway department; this includes bridges and the amount of the tax is three per cent. Claims for reimbursement for payment already made may be filed.

Chicago — Although new inquiry for

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SHARPSBURG, PITTSBURGH (15) PENNSYLVANIA

fabricated structural steel is in low volume at the moment, the level is above the ability of fabricators to accommodate. The same applies to steel piling, both sheet and bearing type. As a result, much of the new business coming out for bids attracts little interest. Fabricators are booked for many months ahead and with plain material from mills available only on a quota basis, shop operations can be maintained only at fixed level.

Birmingham — Activity in the Birmingham district's structural shape market continues spotty. A sustained overall demand for small tonnage continues for a variety of small projects. A contributing factor in the plate situation is the difficulty in obtaining materials for major projects.

Seattle — Bids for construction of the Narrows bridge will be received by Washington Toll Bridge Authority, Olympia, Oct. 15, involving 14,241 tons shapes and 4732 tons wire cable. The suspension structure will be four-lane, 2800 feet long with two side spans, 1100 feet each. This bridge will replace a two-lane span destroyed by wind Nov. 7, 1940. The original piers will be used.

Pacific Telephone & Telegraph Co. plans an 11-story steel frame \$4 million long distance exchange building at Portland, Oreg., construction in early 1948, plans by Pietro Belluschi, Portland architect, tonnage unstated.

Fabricating plants in this area are confining new business to small jobs within range of current steel supplies which continue inadequate. Mill deliveries are behind schedule and no immediate improvement in the situation is seen.

Warehouse . . .

Warehouse Prices, Page 141

New York — Adjustment of warehouse steel prices in line with mill increases and extra revisions is practically complete with the markup on cold-drawn seamless mechanical tubing. The change in nails follows closely the old OPA pattern, cost (carlots) plus 20 per cent to dealers. Lack of steel is retarding warehouse volume in flat-rolled carbon products, galvanized sheets, plates and structural. Except for flats and some small rounds, cold-finished bar inventories are getting into balance with demand.

Boston — While there is spotty improvement in warehouse inventories, there is none covering hot-rolled or galvanized sheets, structural, plates and most wire products, notably nails. Cold-finished bars and cold-rolled sheets are in slightly better supply in more sizes, while alloy stocks more than balance demand. Heaviest inquiry is for products in shortest supply with indications this trend will continue through the balance of this year; sheet, plate, structural and strip tonnage will be scarce next quarter based on allocations to distributors.

Cincinnati — Warehouses of the district, having drained off some of their stocks last month during mill curtailments, are hard pressed for wanted items to maintain sales volume at previous levels. Demand is unaffected by the recent price increases. Talk among jobbers centers about narrowing of the differential, by adoption of the new prices.

Seattle — The warehouse situation is unchanged, demand for all out-of-stock items strong in the face of increased prices. Mill allocations are far under

requirements and scarce items show no improvement, this being particularly true of sheets which continue critically short. Small reinforcing bars are also extremely scarce.

Rails, Cars . . .

Track Material Prices, Page 139

New York — Following recent heavy orders, freight car buying has declined, only a few scattered orders having been placed last week. A few sizable inquiries, however, are still pending.

Toronto, Ont. — Canadian Pacific Railway Co. will place orders by the end of this month for rolling stock to cost \$22,500,000, according to W. W. Neal, president. He also stated that these new

orders will bring the company's total expenditure for the season to more than \$47 million.

Tin Plate . . .

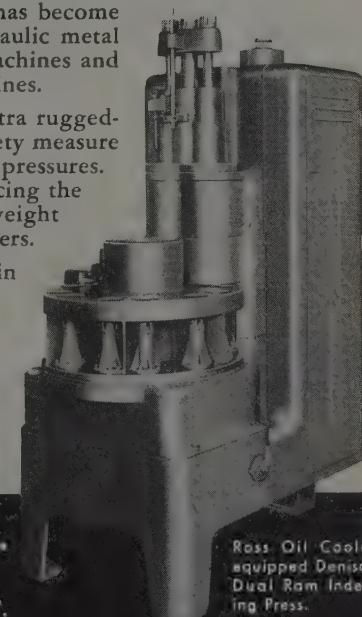
Tin Plate Prices, Page 139

Chicago — Although production of tin plate is being maintained at a high level, when doled out to consumers it fails to meet requirements. Manufacturers of cans, containers and closures have heavy order backlogs but are forced to base their operations on the tonnage of tin plate receipts from mills. Notwithstanding the critical shortage of box cars, tin plate makers have been able to keep the product moving out except for temporary holdups.

● Selection of extra heavy Ross "BCF" Oil Coolers as original equipment has become general among builders of hydraulic metal drawing presses, die casting machines and plastic injection molding machines.

Preference is based on the extra ruggedness built into each unit as a safety measure against higher-than-normal oil pressures. This is achieved without sacrificing the small size or relatively light weight typical of regular "BCF" Oil Coolers.

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Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 139

New York—Eastern bolt and nut sellers report a slight decline in order backlog. Demand is steady, but shipments are somewhat more active. However, there is still a tremendous shortage of small bolts, $\frac{1}{2}$ by 6 inches and under, for manufacturing assemblies, and makers are having continued difficulty getting nut steel and steel in the wire sizes.

While unable to meet all requirements for export, bolt and nut makers declare there has been some falling off in foreign buying because of the increasing scarcity of dollar exchange. This has been noticeable for some time in the Far East, particularly in India, but more recently South American countries have

been restricting demand because of a growing shortage in dollars. Argentina appears to be about the only major consuming country in South America which has not been affected by this stringency due to her favorable export balance with this country.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 140

Pittsburgh—Pinch in metallurgical coke supply continues and there is little indication of any early change in the situation. The plain fact is metallurgical coal seams in this district are increasingly under pressure to meet the demands of the district and they are not just up to it. At the moment the market is firm at

the recently established price levels with Connellsburg furnace quoted \$11.50 to \$12, and Connellsburg foundry, \$14 to \$15. Oven foundry coke is held at \$15.71, Fairmount, W. Va., the Pittsburgh delivered price being \$17.61.

Philadelphia—Oven foundry coke has been advanced \$1.25 a ton at ovens here and Swedeland, Pa., to \$16.75; and \$2.50 at Kearney, N. J., to \$17.85.

Despite the recent advance in oven foundry coke prices, some grades of beehive are being shipped from western Pennsylvania into Philadelphia at even higher levels, as high as \$19.50, it is understood.

Iron Ore . . .

Iron Ore Prices, Page 140

Cleveland—Blast furnaces in the United States and Canada consumed 6,156,401 gross tons of Lake Superior iron ore in July, a decline of 343,481 tons from the 6,499,882 tons consumed in June, according to the Lake Superior Iron Ore Association, Cleveland. July, 1946, consumption was 6,423,035 tons. Of the tonnage consumed in July, 1947, 5,936,426 tons was used in this country and 219,975 in Canada.

Cumulative consumption for the first seven months of this year was more than 50 per cent greater than for the comparable period of 1946, 46,387,053 tons having been consumed this year against 30,665,323 tons in the January-July period of 1946.

Total stocks of ore at furnaces and domestic Lake Erie docks on Aug. 1 amounted to 28,440,332 tons, compared with 21,745,798 tons stocked on July 1 and 30,438,615 tons available on Aug. 1, 1946. Of the total as of Aug. 1, 24,781,067 tons was at domestic furnaces, 895,761 tons at Canadian furnaces and 2,763,504 tons at Lake Erie docks in the United States, compared with July figures of 18,869,689 tons at American furnaces, 724,006 tons at Canadian furnaces and 2,152,103 tons at American docks on Lake Erie.

Between July 1 and Aug. 1, 25 furnaces were put on blast in the United States following vacation shutdowns and the coal miners return to the pits. Total blast furnaces operating on Aug. 1 was 175, with 18 American and 2 Canadian furnaces idle. Of the 175 on blast, 167 were in this country and 8 in Canada.

Canada . . .

Toronto, Ont.—With the idea of bringing out larger quantities of iron scrap materials and to relieve the critical shortage of scrap in Canada, War-time Prices and Trade Board has discontinued ceiling prices and controls on cast scrap, stove plate and malleable scrap. So far, however, local dealers have not established new prices, although some dealers state they are offering \$30 per gross ton for No. 1 cast, but have not set a selling price.

Under the price ceiling No. 1 cast scrap was quoted \$19 per gross ton, delivered Toronto. There is no stove plate, cast car wheels or malleable scrap available on the market. At present Canada is facing a critical position with regard to both iron and steel scrap, and the shortage may effect steel production schedules during the winter unless sufficient large tonnages are imported. Domestic scrap supply is said to be less than 25 per cent of actual needs. However,



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there has been no lifting of ceiling prices or controls on steel scrap.

Following the announcement that the United States has decided to reimpose strict wartime controls on steel exports, it is stated that Canada will continue to obtain unrestricted imports of American steel. Canadian Steel Controller, W. E. Uren, stated that he had not been advised of any change in Canada's status with regard to imports of steel from the United States, now running at the rate of between 800,000 and 1 million tons annually on a normal trade basis. From other sources it is learned that the new steel control steps announced in Washington for October were along the lines of those in effect during the war and would not affect Canada. The United States export control in wartime did not apply to Canada since the signing of the Hyde Park agreement between the two nations. Under that pact, the needs of Canadian steel users were regarded in the same category as those in the United States.

Pig Iron . . .

Pig Iron Prices, Page 140

Cleveland — Foundries report supplies of raw materials are tighter than they have been at any time since the end of the war. Scrap is being offered in substantial volume but at prices which foundries claim they cannot pay. No. 1 cupola cast is offered, for instance, at \$45 to \$46, but comparatively small tonnage are being taken at that level. One of the leading merchant stacks is down for repairs, restricting the flow of iron. Prices for the latter are also high with one of the leading suppliers billing on the basis of heavy melting steel scrap, or at \$40.75 for pig iron shipments during the week ended Aug. 23. The recent heat wave in this district tended to slow down foundry operations.

Chicago — No producer of pig iron in this district has followed the lead of Republic Steel Corp. of setting prices in Cleveland and Buffalo in relationship to open hearth scrap. Opinion is that the policy has merit insofar as basic iron is concerned, but has drawbacks on foundry iron. Fact that scrap prices have dropped sharply undoubtedly has headed off serious consideration of the new pricing policy here. Although unprecedented hot weather has affected pig iron output somewhat, production of castings has been reduced to an even greater degree. However, the latter has in no wise reduced pressure for iron deliveries but has resulted in requests for some coke to be held back.

Boston — Pig iron inventories are low and the volume of Buffalo tonnage reaching this territory is meager. A few gray iron shops are seeking new volume and most users of castings are tightening inspection of castings supplied by sub-contracts. Where possible there is a tendency to increase the ratio of iron to scrap in melts for improved quality, but the supply of iron has not improved to the point to make this possible in many cases. Another shipment of British iron, close to 1,000 tons, is due to arrive shortly. Foundry coke has advanced \$1.95 a ton, Providence, R. I., and \$1.90, Connecticut.

New York — Pig iron consumers are continuing to receive far less tonnage than they can use and see little improvement ahead over the next few weeks. In fact, they doubt if they will receive in September even as much iron as at present

for the reason that the month has only 30 days, as compared with 31 for August. However, foundry operations will be curtailed by the Labor Day holiday.

Philadelphia — Demand for pig iron is as urgent as ever with some producers unable to maintain shipments because of operating difficulties. One district producer recently had to take wind off for eight hours, following a similar experience earlier in the month for 10 hours. Next month, being a 30-day period, not much improvement in output is expected.

Pittsburgh — Movement of pig iron continues in about the same volume as in recent weeks with merchant iron in extremely tight supply. Some slowing down in foundry operations is reported

as a result of the tight pig iron supply situation. Hot weather, of course, is a powerful influence for slower operations. The weather here has been oppressively hot and humid all through August and it is not unexpected that after such a prolonged hot spell operations in foundries and steelworks would be affected to some extent.

Local sellers of pig iron express deep interest in last week's action of Republic Steel Corp. tying its pig iron price to the price of heavy melting steel scrap. However, so far as can be learned no producers in this district are adopting the practice, at least not for the moment, being inclined to ride along as in the past.

Buffalo — Overall demand for pig iron

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Blast Furnace Capacity and Production—Net Tons

JUNE, 1947

	Number of companies	Annual blast furnace capacity	PRODUCTION							
			PIG IRON		FERRO MANGANESE AND SPIEGEL		TOTAL			
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Current month	Year to date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	12,551,280	867,773	5,430,201	24,271	152,560	892,044	5,582,761	86.4	89.6
Pittsburgh-Youngstown	16	25,042,040	1,862,717	11,515,754	17,267	88,004	1,879,984	11,603,758	91.2	93.4
Cleveland-Detroit	6	5,557,500	469,945	3,010,216	-	-	469,945	3,010,216	87.1	92.5
Chicago	7	14,097,710	1,045,894	6,183,450	-	-	1,045,894	6,183,430	90.2	88.4
Southern	8	4,924,670	327,219	1,947,228	8,359	54,209	332,578	2,001,437	82.8	81.9
Western	4	2,536,000	186,364	1,087,429	-	11,297	186,364	1,098,726	89.3	87.3
TOTAL	36	65,709,200	4,759,912	29,174,258	49,897	306,070	4,809,809	29,486,328	89.0	90.4

has increased here in the last week and talk of "soft spots" in the foundry picture has disappeared. Adding to the pressure have been inquiries from New England melters who more recently had been getting their iron from Everett, Mass., but apparently not enough to meet requirements. They have been meeting with little or no success in their efforts to renew customer relations with local merchant producers, who have all the business they can handle. Republic's new pricing policy came as something of a surprise to the foundry trade, but other producers gave no inkling of intention to follow suit.

Cincinnati — Pig iron is moving steadily into this district from both the northern and southern furnaces. Tonnage, however, is far under demand so that, despite high prices, melters are using a large proportion of scrap. Furnaces are trying to key allotments to previous volume, pressure for more iron appar-

ently being futile in the near view.

Birmingham — Pig iron demand continues out of all bounds. The short supply situation is expected to last indefinitely, in the opinion of major iron users, and has been accentuated by closing of the government-owned blast furnace at Gadsden. Sloss-Sheffield and Woodward Iron Co. have said nothing thus far relative to increased prices in line with Republic Steel Corp.'s action recently.

St. Louis — Pig iron demand here is on the increase generally but soft spots are beginning to show up. For example, Kansas City, normally a big consumer of iron from this district, is easing pressure. Demand from general foundry lines there is off a little, although specialty foundries are still going strong. A partial explanation is the five-week foundry strike there. Demand from stove manufacturers too is slowing a bit, principally because of steel shortages. Biggest pig user here,

Granite City Steel Co., is being supplied all its needs now by Koppers, which says it is obtaining additional iron for Granite City, which gets its metal in hot form, formerly was on an iron quota which held it to 16 to 17 per cent iron in the melt. Now it is up to a 25 to 38 per cent ratio, with resulting savings in steel costs and conservation of scarce scrap. The local 1000-ton daily iron output continues equally divided between basic and foundry iron.

Scrap . . .

Prices of cast iron grades drop, but tone of steelmaking scrap market steadies

Scrap Prices, Page 144

Philadelphia — Steel scrap prices have steadied here somewhat, following rather sharp declines during the past fortnight or so. Heavy melting steel scrap, for instance, was quoted at the close of last week at \$36.50 to \$37.50, delivered, as compared with \$37 to \$37.50 a week earlier. Buyers were still somewhat indifferent, but the tone of the steel scrap market was firmer, at least for the moment.

On the other hand, cast scrap, which has been holding relatively steady while steel scrap was moving downward, dropped rather appreciably during the latter part of last week. Cupola cast is now \$45 to \$46, delivered; charging box cast, \$44.50 to \$45.50; heavy breakable cast, \$44; clean auto cast, \$46.50 to \$47.50. Unstripped motor blocks are off slightly to \$40 to \$41 while malleable and No. 1 wheels are unchanged.

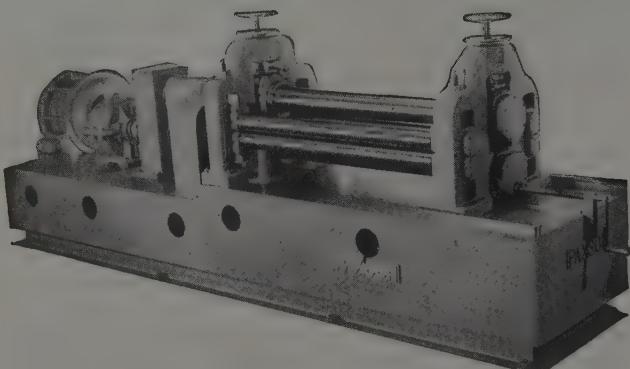
Steel turnings are unchanged, but bar crops plate and punchings are down to \$40 to \$41; cut structurals, \$39 to \$39.50; electric furnace bundles, \$39 to \$40; and heavy turnings, \$38 to \$39.

New York — Steel scrap prices now have reached a point where there is less rush of selling, although the market is still on the easy side. Brokers here are now paying \$32, a drop of \$1 a ton from a week earlier, for No. 1 and No. 2 heavy melting, No. 1 busheling and Nos. 1 and 2 bundles. Machine shop and mixed borings and turnings are being bought at \$24 to \$25, and short shovel turnings at \$26 to \$27. Brokers also have reduced their buying prices on low phosphorus scrap, with punchings and plate scrap and cut structurals now at \$34 to \$35 and electric furnace bundles at \$33.

While melting steel prices are somewhat steadier, the market on the principal cast grades has dropped rather sharply, with No. 1 cupola cast, charging box cast, and heavy breakable off to a range

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of \$36 to \$37, and unstripped motor blocks down to \$34. Malleable is unchanged.

Consumers generally are still moving cautiously, although with their inventories light there are reasons for believing that the present downward trend may be nearing its end, with a general leveling off in prospect.

Boston — From the peak on the recent advance, heavy melting steel scrap is off \$6 to \$7 a ton with new buying light. Substantial tonnage of scrap bought at \$35 to \$37 has yet to be shipped, due partly to lack of cars and lagging yard operations. There is also an easier tone in cast grades. Turnings and other steel grades are lower, but the decline in prices is not as drastic as in heavy melting scrap. Machine shop turnings are quoted \$24 to \$25; short shovel turnings, \$26 to \$27; bar crops punchings and plate scrap, \$34 to \$35. Stove plate is \$1 lower at \$35 to \$36.

Pittsburgh — Some small lot sales occurred last week at \$38 for heavy melting steel, continuing the downward trend initiated two weeks ago. There is some indication that leading producers are seeking to force the market lower to around \$35; however, as long as brokers have substantial tonnage commitments at \$40 and above there is little prospect mills will be able to contract for large tonnages much below this level. Most brokers contend they would not be able to fulfill large tonnage commitments for heavy melting steel at less than \$40 per ton. During the last price break some interests were unable to complete shipment on low priced orders at the commitment prices when the mills re-entered the market on a large scale, for broker-dealer buying prices were forced sharply upward. More frequent mill rejections of scrap shipments that are not up to specifications is said to be another indication of producers' concerted effort for more reasonable scrap prices. There is some doubt that the \$35 heavy melting steel scrap price level can be achieved because of the persistent shortage in the face of practical capacity steel operations. Further weakness also developed last week in turnings and cast scrap grades, and railroad scrap lists reflected general easing in entire scrap market with declines of 50 cents to \$1 noted among the various items.

Chicago — Scrap prices continue unchanged from a week ago, leading consumers purchasing limited tonnages of open-hearth material for \$39 a ton delivered. New buying is light as mills are receiving heavy shipments against old orders made when prices ranged variously up to the all-time peak of \$42.50. At least 30 days will be required to clean up these commitments. So far the local market has not been affected by the declines in eastern markets last week, the reason being that supply of melting material in this district remains tight.

Buffalo — Prices of steelmaking scrap leveled off last week after a drop of \$3 a ton, although leading consumers took no part in the proceedings. Some sources said buying to fill \$43 contracts was the steady influence, while others asserted that covering was pretty well completed. A real test of the market is scheduled when the high-priced orders expire around the end of this month. A sale of choice No. 1 heavy melting steel, to a mill whose requirements are stiff, was reported at \$42, which compared with \$45 paid several weeks ago.

Cleveland — Reflecting the easier scrap market in the Pittsburgh district where sales were made last week at \$38, the undertone of the market here also weakened. Although mills remained out of the market, heavy melting steel was quoted \$37 to \$38, off \$1 to \$1.50 from the previous week's levels. Some mills were still placing some tonnages in stocks as shipments on old contracts maintained a steady flow. Foundries were still short of scrap but many refused to make new commitments at present high levels based at \$45 to \$46 for No. 1 cupola cast.

Youngstown — Scrap shipments were somewhat smaller last week than they were earlier in the month, due in large measure to the unusually hot weather. The movement was large enough in most instances, however, to cover current consumption. Brokers were active in filling old orders on the basis of \$44 to \$45.50 and this business is expected to continue over the balance of this month and into the first week of September. Although no sales have been reported under \$40, the market was quoted \$38 to \$40 on the basis of the downturn in the Pittsburgh market. Mills are expected to enter the market at the \$38 or lower level when new contracts are made. Machine shop turnings were quoted unchanged at \$34 to \$35.

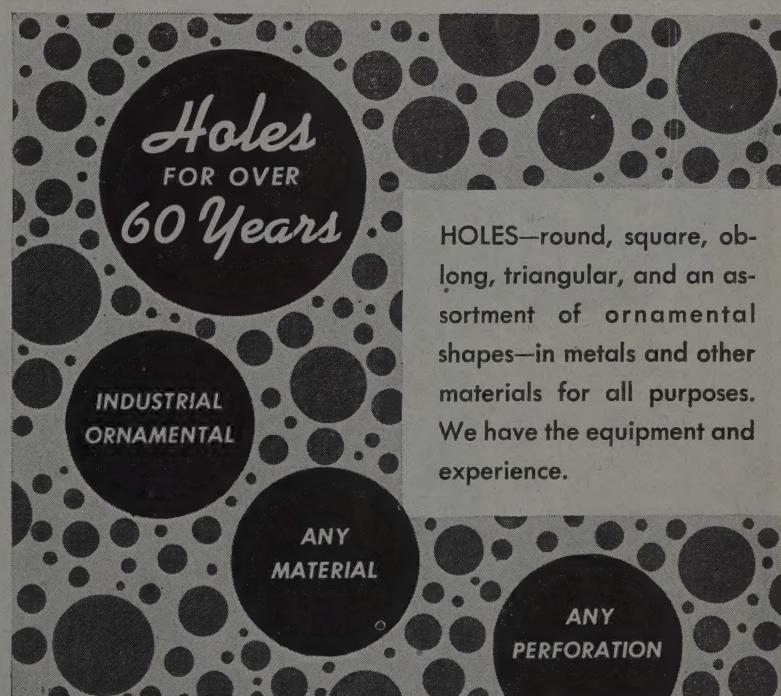
Detroit — Pressure, appearing to be principally sentimental, continues directed at scrap prices. Turnings and mixed borings and turnings are off \$1 here to \$27.50 to \$28, while short shovel and cast iron borings are likewise quoted \$1 lower. Low-phos plate is marked down 50 cents per ton. Steel grades

and foundry scrap are unchanged.

Cincinnati — Although the iron and steel scrap market continues unsettled, prices are unchanged after the sharp dip in the preceding week. Mills are reluctant to do any new tonnage buying, thereby creating an undertone of weakness. Country scrap is decidedly weaker, although cast, in the face of maintained demand, appears to be bucking the trend. Some interests are bullish on the long pull, contending that the high steel-making rates mean a future dearth of available scrap tonnage.

Birmingham — Unofficial reports indicate scrap has eased somewhat in this district from the hectic past few weeks. Even so, brokers declare the market is so confused and prices so meaningless they will not make quotations for publication this week. They hope, they said, for some semblance of order during the week. Sharp drops from the recent all-time high are reported, although official prices are not posted.

St. Louis — Scrap prices in this district have eased off a trifle and steel mills have reentered the market after a two-week withdrawal to force down quotations. No. 1 and No. 2 heavy melting steel dropped 50 cents a ton while railroad metal is off \$2 to \$3. Characteristically in a softening price market, shipments are somewhat improved as collection points seek to get in ahead of a drop. Scrap movement was down sharply during the recent price peak. Local brokers now expect prices to remain firm at least two or three weeks. Melters continue to complain deliveries are not



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being made on old, lower-price contracts.

Seattle — The scrap situation is again causing concern as shipments are below expectations when the price was advanced \$2 to \$22, fob mill. Dealers seem to be holding off but any marked break in the eastern market will be reflected on the Pacific Coast. Ship breaking plants are producing more tonnage but they complain of government lethargy in releasing surplus ships for scrapping.

Battle Lines Being Drawn For Basing Point Struggle

(Continued from page 53)

delivered prices will result as though the industry were operating under a single basing point system, and as though all mills were under one ownership and control."

The attack by the Commission is interpreted in Washington as part of a mounting campaign against high prices in general. It has been foreshadowed for some time by charges made before the Senate steel supply investigation, and by word some time ago that the committee was referring various aspects of the steel situation to other government agencies for study.

Federal Trade Commission action, if sustained, would result in less severe penalties than would an anti-trust action

by the Department of Justice, according to some sources. However, as an attack on commodity prices, it was not clear as to just what result was in mind. According to all indications, the FTC charges could lead to protracted litigation, so that no immediate effect on the steel price level would follow.

The present charges center around use of the multiple point basing system in maintaining uniform prices and charges by the respondents. The commission have exercised that domination and charges that "the producer-respondents power to control and manipulate the market collectively through the offices of the American Iron & Steel Institute.

"That fact is evidenced by action taken in connection with the increase in steel prices which was announced during July 1947. Producer-respondents collectively supported that increase through the offices of the Institute. Representatives of producer-respondents have announced that the increase aggregated hundreds of millions of dollars."

"Inherent effects" of the alleged collusive practices, the Commission said, included "substantial lessening of competition" and "unfair and oppressive discrimination against portions of the purchasing public in large areas."

The complaint continued that this

discrimination in price is effected by depriving purchasers of the advantage which otherwise would accrue to them as a result of their proximity to plants of the respondent producers and by requiring purchasers to pay increases over what the net prices would have been had they been fixed by competition.

For the purpose of frustrating price competition, said the Commission, "the respondents by concerted action and agreements adopted and systematically put into effect a common method and policy with regard to competition and prices, and other kinds of competition directly and substantially affecting prices."

The Commission specifically charged the companies had entered into agreements and understanding that they would offer their respective products for sale on a basis of price quotations co-operatively and collectively provided for under a system of common basing points, common terms, and sales conditions determined by joint action. All these practices, the Commission charged, were designed to result in "identical delivered price quotations."

Identical Prices Quoted

The common basing point system used, said the Commission, utilized a formula through which identical price quotations at any given destination "may be automatically arrived at with mathematical precision."

Further, the Commission charged, "the respondents have agreed upon a common list of charges to be added to base prices in lieu of switching, shipping and freight charges," said the Commission, and these were compiled and published by the Institute, to be employed by the producing companies in calculating delivered price quotations.

In using this system, said the Commission, the companies "have refused to assess their charges for delivery according to actual cost," calculating delivery charges "on the fiction that each shipment is made from one of a limited number of common basing points co-operatively used and recognized among producer-respondents."

The Commission also charged the respondents with using "fictional" all-rail freight in assessing delivery charges, when actually delivery employed was "frequently" by truck or water carrier at lower rates. Also, the Commission said, "arbitrary amounts" have been added to delivered prices as switching charges, rather than the actual charges imposed by the railroads for switching.

Among other steps taken to avoid price variations, the Commission concluded, there was an agreement among the companies as to standards and specifications covering every possible varia-

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tion and classification of product. The companies, said the Commission, had "a common understanding and agreement as to basic products upon which the prices were quoted, and have agreed upon 'extra charges' or additions to the base prices to cover every characteristic of an iron or steel product differing from those specified in the basic product classification."

From time to time, said the Commission, these extras have been substantially increased without relation to actual cost involved, "the extras on a multiple of alloy steel products having been increased to a point where they are several hundred per cent of the base price."

Respondents in the action have until Sept. 19 to answer the charges, which date was set by the Commission for the hearing. If, after the hearing, the Commission should issue a "cease and desist" order, it could seek millions in civil penalties in the courts should the producers fail to comply.

At the moment it is not certain whether a lengthy legal battle over the question is in prospect. While there is every indication the respondents will carry the case to the highest court, a process which undoubtedly would take several years, it is barely possible the FTC might abruptly terminate its action in event the Supreme Court rules to uphold a lower court decision in favor of basing point pricing in the cement industry case. This latter case, it is understood, may be decided some time this fall, the Supreme Court several months ago having consented to review the decision handed down by the Seventh Circuit Court of Appeals on Sept. 20, 1946. The cement case has been in the courts since July, 1937.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

- 2200 tons, power plant, Consolidated Electric Light & Power Co., Baltimore, to Belmont Works, Eddystone, Pa.
- 1100 tons, research laboratory, Armstrong Cork Co., Lancaster, Pa., to Bethlehem Steel Co., Bethlehem, Pa.
- 800 tons, including flooring, state bridge, South St., Wilkes-Barre, Pa., to American Bridge Co., Pittsburgh.
- 485 tons, warehouse addition, E. J. Lavino & Co., Plymouth Meeting, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.
- 400 tons, bridge, cont. 2812, Ft. Wayne, Ind., for State Highway Commission, to Midland Structural Steel Co., Cicero, Ill., for fabrication by Allied Structural Steel Cos.; Reith-Riley Construction Co., Goshen, Ind.
- 350 tons, plant addition, Budy Tubing Co., Homestead, Pa., to Lehigh Structural Steel Co., Allentown, Pa.
- 300 tons, public school No. 121, Jamaica, Long Island, to Harris Structural Steel Co., New York.
- 375 tons, plant building, Lever Bros. Co., Baltimore, to Bethlehem Steel Co., Bethlehem, Pa., through Stone & Webster Engineering Co., Boston.
- 180 tons, plant building, Baldwin-Duckworth Division, Chaia Belt Co., Worcester, Mass.,

to Grossier & Schlager Iron Works, Somerville, Mass.

STRUCTURAL STEEL PENDING

- 16,000 tons, Tacoma Narrows bridge, Seattle, Wash., for state; bids Oct. 15.
- 14,241 tons, also 4,732 tons wire cable, Narrows bridge; bids to Washington State Toll Bridge Authority, Olympia, Oct. 15; completion specified 830 calendar days.
- 7500 tons, Lillian Wald housing development, Manhattan, New York, to be built of reinforcing steel, instead of structural steel, if project goes ahead.
- 1305 tons, beam spans in Kansas, for Atchison, Topeka & Santa Fe railroad; Bethlehem Steel Co., Bethlehem, Pa., low on 1030 tons, Kansas City Structural Steel Co., Kansas City, Kans., low on 275 tons; bids Aug. 18.
- 1300 tons, passenger station remodeling, New York Central railroad, Toledo, O.; bids Aug. 25.
- 1200 tons, 20-story apartment, for Simon Bros., 69th St. and Fifth Ave., New York, bids asked.
- 800 tons, housing project, American Community Homes, Forest Park, Ill.
- 600 tons, New Jersey State bridge, route No. 25, Newark, originally proposed for bidding Aug. 27, withdrawn.
- 500 tons, 8-story apartment, Levi Bros., Bronx, New York city, bids asked.
- 125 tons, station alterations, Frankford elevated, Philadelphia.
- 100 tons, sheet piling, diesel shop, Chicago & North Western Railroad, Chicago; bids Aug. 24.

REINFORCING BARS . . .

REINFORCING BARS PLACED

- 4085 tons, concrete wall and levee, Parkersburg, W. Va.; bids to U. S. engineer, Huntington, W. Va.
- 400 tons, University of Washington administra-

tion building and library, Seattle, to Bethlehem Pacific Coast Steel Co., Seattle.

Unstated, \$600,000 feed mill, warehouse and elevator, Washington Co-operative Farmers' Association, Tacoma, to unstated interest.

REINFORCING BARS PENDING

- 3000 tons, approximately, Lillian Wald housing development, Manhattan, New York city, will be required instead of structural steel, should project go ahead; recent general contractors bids on this project indicated a lower cost for reinforcing steel as compared with structural steel.

848 tons, Narrows bridge; bids to Washington Toll Bridge Authority, Olympia, Oct. 15.

300 tons, mercantile building superstructure, Evanston, Ill., for Walter P. Powers.

275 tons, highway project, Whitehouse-Oldwick Road, Hunterdon county, New Jersey; bids Aug. 29, state highway commissioner, Trenton.

275 tons, New Jersey state road project in Hunterdon County, bids due Aug. 29.

250 tons, diesel shop, Chicago & North Western Railroad, Chicago; bids Aug. 24.

200 tons or more, two Washington state highway spans; Starbird Construction Co., \$18,760, and Roy L. Bair, Spokane, \$47,700, lows.

200 tons or more, Bureau of Roads bridge, Mt. Hood national forest, Tom Lillebo, Reedsport, Oreg., low \$81,666.

200 tons, Washington state highway projects Cowlitz, Pacific and Lewis counties; bids to Olympia Sept. 3.

144 tons, sewage treatment plant, Tomah, Wis.; Central Engineering Co., Oshkosh, Wis., low on general contract; bids Aug. 8.

130 tons, filtration plant, Port Washington, Wis.; Joseph J. Duffy Co., Chicago, low on general contract; bids Aug. 6.

Unstated, lumber storage pier and warehouse for Dock Commission, Portland, Oreg., to

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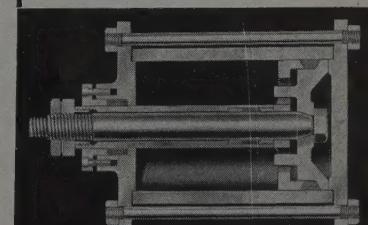
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General Construction Co., Portland, \$1,830,-852.

Unstated, Fibreboard Products Inc., plant, Portland, Oreg.; general contract to E. E. Settergren, Portland.

Unstated, nurses home and ward hospital, Salem, Oreg.; Sound Construction Co., Seattle, low, \$887,100 and \$732,321 respectively.

PLATES . . .

PLATES PLACED

600 tons plus, 26,150 feet 18 inch steel pipe, for Hillsboro, Oreg., to Beall Tank & Pipe Co., Portland, Oreg.

PIPE . . .

STEEL PIPE PENDING

Unstated, 19,000 ft. 6 inch 10 gage water pipe for Bertha water district, Portland, Oreg.; Pacific Water Works Supply Co., Portland, low \$19,499.

CAST IRON PIPE PENDING

1560 tons, 6 to 16-inch, mostly 8-inch, district

government, Washington; bids Aug. 26; also 76 tons water pipe specials.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & Illinois Midland, 350 seventy-ton gondolas, to Pullman-Standard Car Mfg. Co., Chicago.

Illinois Terminal, 100 fifty-ton box cars, to American Car & Foundry Co., New York. Lehigh & New England, 1418 tons, to Bethlehem Steel Co., Bethlehem, Pa.

Peoples Gas, Light & Coke Co., 10 hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

New York City Board of Transportation, 100 subway cars and 10 extra trucks, bids Sept. 2.

LOCOMOTIVES PLACED

Union Pacific, five 2000-horsepower diesel locomotives and five 1500-horsepower diesel locomotives, to Fairbanks, Morse & Co., Chicago.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Trailmobile Co., 1765 E. 46th St., has awarded a \$57,600 contract to Fred R. Cooper, 1765 E. 46th St., for construction of two factory additions.

LOS ANGELES—General Petroleum Corp., 108 W. Second St., will construct an industrial relations building at its Torrance refinery at a cost of approximately \$100,000.

SAN FRANCISCO—G. B. Torre & Sons, 103 Bay St., proposes to build a \$200,000 plant. Plans are by J. A. Riddell, 333 Kearney St.

GEORGIA

ALBANY, GA.—Georgia Power Co., 75 Marietta St. N.W., Atlanta, has awarded a \$55,000 contract to Van Winkle & Co., Whitehead Bldg., Atlanta, for construction of the superstructure of a power plant.

ATLANTA—Caterpillar Tractor Co. has awarded a \$120,000 contract to Southern Concrete Products Co., 1108 Chattahoochee Ave. N. W., for construction of a plant.

BREMEN, GA.—Sewell Mfg. Co. has awarded a \$90,000 contract to Black & Munn, 161

Spring St., Atlanta, for construction of a factory addition.

EAST POINT, GA.—Dixie Paint & Varnish Co., Brunswick, plans to build a \$100,000 ink manufacturing plant here.

ILLINOIS

EVANSTON, ILL.—Korhumel, Heffron & Preiss Steel Co., 6559 S. Lorel St., Chicago, has started construction on a \$750,000 plant on Oakton St. Architects and engineers are Fox & Fox, 549 W. Randolph St., Chicago.

INDIANA

BREMEN, IND.—Liberty Coach Co., H. L. Spencer, president, plans to build a \$250,000 factory addition.

HAMMOND, IND.—Swift & Co., W. A. Burnett, superintendent of construction, N. S. Yards, Chicago, plans to build a \$150,000 refining plant project here. Engineer is W. H. Ruskamp, c/o owner.

ROCHESTER, IND.—Sealed Power, Muskegon, Mich., plans to build a 1-story factory to cost about \$200,000. Engineer is E. C. Young, c/o owner.

SYRACUSE, IND.—Liberty Coach Co., H. L. Spencer, president, proposes to build a \$100,000 factory.

LOUISIANA

DELPHI, LA.—Sun Oil Co. and associates, 1608 Walnut St., Philadelphia, has awarded a \$2,750,000 contract to Petroleum Engineering Inc., Commerce Bldg., Houston, Tex., for construction of a natural gasoline extraction plant.

LAKE CHARLES, LA.—Cities Service Refinery Corp. and Continental Oil Co. will build a lubrication plant on a 183-acre tract here. Contract has been awarded to Lummus Co., 420 Lexington Ave., New York. Engineer is Max B. Miller & Co. Inc., 501 Fifth Ave., New York.

NEW ORLEANS—Avondale Marine Ways Inc. has received a \$374,000 contract from the Federal Barge Lines for construction of a towboat to be used with the Integrated Tow Barge on the Mississippi.

NEW ORLEANS—Lone Star Cement Corp., Hibernia Bank Bldg., plans a precipitator building, a kiln stack and a precipitator dust bin at its plant as part of a \$1 million improvement program.

SHREVEPORT, LA.—Mosher Steel Co., c/o H. E. Perry, 3910 Washington Ave., Houston, Tex., plans to build a \$650,000 fabricating plant here.

MASSACHUSETTS

NEWTON UPPER FALLS, MASS.—David Nassif Co. has awarded a \$600,000 contract to H. K. Ferguson Co., 19 Rector St., New York, for a factory. Contractor is seeking bids from sub-contractors.

MICHIGAN

JACKSON, MICH.—Le Fere Forge & Machine Co. has awarded a \$100,000 contract to Austin Co., 27 Curtis Bldg., Detroit, for the design and construction of a forge shop addition.

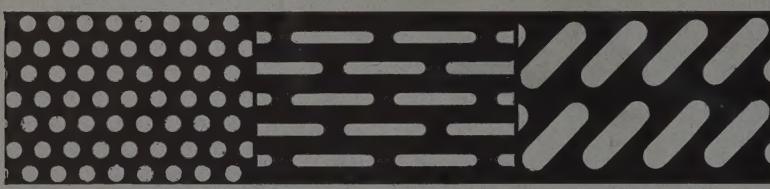
MONROE, MICH.—Kelsey-Hayes Wheel Co. has awarded a \$75,000 contract to Darin & Armstrong, 2041 Fenkell Ave., Detroit, for a power plant addition.

MISSOURI

ST. LOUIS—Pittsburgh Plate Glass Co. has awarded a \$360,000 contract to Woermann Construction Co., 3800 W. Pine Blvd., for the erection of a distribution warehouse, regional offices and sales building at Grand Blvd. and Market St.

NEW JERSEY

CAMDEN, N. J.—Allied Metal Stamping Co., 1475 S. Sixth St., has awarded a \$55,000 contract to Phillips Grabowski, 1208 Chase



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